Central Valley Regional Water Quality Control Board
Conditional Waiver for Irrigated Agriculture Monitoring Program Phase II
Sampling Results

Quarterly Report – Activities from July 1, 2005 – September 30, 2005

Prepared for the Central Valley Regional Water Quality Control Board

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EXECUTIVE SUMMARY

Irrigation season monitoring occurred between June 13 and August 10, 2005. Thirty sites were sampled, each site being sampled once every two weeks, for a total of four samples per site. Among the thirty sites, one site (CS22) was dry for the first three sampling periods and, subsequently, cancelled for the fourth period. Another site (CS24) was added in the third sampling interval and, therefore sampled only twice. The samples were analyzed for toxicity, pesticides, metals, nutrients, physical parameters, hardness, and total organic carbon. Pesticide screening or a more selective sample collection was done depending upon the condition of the site, for example no flow or puddle-like conditions. Additionally, thirty-four sediment samples were collected and analyzed for toxicity and chemistry by UC Berkeley.

One hundred and eleven surface water samples were collected for each of the seven pesticide groups: organochlorine pesticides (OCH), organophosphate pesticides (OP), pyrethroids, carbamates, herbicides, acaricides, and fungicides. The most commonly detected pesticide was chlorpyrifos (25% of total samples), followed by metolachlor (24%), trifluralin (18%), and dimethoate (14%). Frequencies of detection for other pesticides ranged between 0-10%.

Herbicides were detected with the greatest frequency of the seven classes of pesticides, occurring in 45 of 111 samples (41%) throughout the entire central valley. The water samples were analyzed for twenty-three herbicides. Sixteen herbicides were analyzed at a screening level only and although the analyses are qualitatively reliable, the quantification of these results should be considered estimates. Among herbicides, metolachlor (24%), trifluralin (18%), and diuron (10%) were the most commonly detected.

Organophosphates were detected at 36% of the sites, also throughout the entire valley. Chlorpyrifos (25%) and dimethoate (14%) were the most commonly detected organophosphates. Carbamates were detected in 10 of 111 samples (9%). Methomyl (5%) was the most frequently detected carbamate. The acaricide propargite was found in 9 samples. Propargite was analyzed at a screening level only. Like the herbicides that were screened, the values for propargite, while qualitatively reliable, should be considered estimates. Pyrethroids were found at 3 sites (CS15, FT24, and FT25) with a different pesticide detected at each site. Organochlorines were only found at one site (SS09). The fungicide captan was not detected at any site.

A total of eighteen pesticides were analyzed at a screening level only. The values reported are qualitatively reliable, but the quantification of these results should only be considered estimates. Sixteen of the screened pesticides are herbicides: alachlor, ametryn, atraton, metolachlor, norflurazon, oxyflurfen, prometon, prometryn, propanil, propazine, prowl, secbumeton, simetryn, terbuthylazine, terbutryn, and trifluralin. The other two pesticides are a pyrethroid, deltamethrin, and an acaricide, propargite.

One hundred and seven water column samples were collected and tested for acute toxicity. Twelve percent of the 96-hour tests with *Ceriodaphnia dubia* resulted in significantly different survival rates of the samples compared to the control group. Four percent of the 96-hour tests with *Pimephales promelas* showed significantly different survival between the samples and

control groups. Only one percent of the tests with the algae *Selenastrum capricornutum* showed significantly different growth to the control group.

BACKGROUND

The California Water Code (CWC) requires that any discharges, or proposed discharges, to surface waters that could affect water quality be described in a Report of Waste Discharge (ROWD). In the past, the Central Valley Regional Water Quality Control Board (CRWQCB) has regulated these waste discharges primarily through the issuance of Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permits. NPDES permits are issued for point source and municipal storm water discharges, but irrigation return flows and storm water discharges from irrigated lands have been excluded from the program as a result of Resolution No. 82-036 "*Waiving Waste Discharge Requirements for Specific Types of Discharge*" which was adopted by the CRWQCB in 1982. This resolution exempted both irrigation return flows and storm water runoff from agricultural lands from permitting requirements. Due to insufficient resources, verification that dischargers were complying with the conditions of the waiver was not conducted and thus the 1982 waiver was largely a passive program.

In 1999, Senate Bill 390 changed the section of the California Water Code that authorized waivers of Waste Discharge Requirements specifying that all discharge waivers in place on January 1 2000 would end January 1 2003 if the Regional Board did not readopt them.

In November 2000, a lawsuit was filed against the CRWQCB by the San Francisco Baykeeper, the Deltakeeper and the California Public Interest Group to constrain the agricultural dischargers to obtain clean water permits and for the Regional Boards to use Waste Discharge Requirements to control discharges of pesticides from irrigated lands.

In July 2003, the Regional Board adopted Resolution R5-2003-0105. This resolution includes two Conditional Waivers, one for Coalition Groups that form on behalf of individual dischargers and the other for individual dischargers, to facilitate compliance with the California Water Code and the Plans and Policies of the Regional Boards. The Resolution R5-2003-0105 stipulates that the Coalition Groups must develop waste monitoring programs to assess the sources and impacts of waste in the discharges from irrigated lands and, if necessary, track progress in reducing the amount of waste discharge that affects the quality of the waters of the state and its beneficial uses. By January 2005 the local groups had to start their own monitoring programs. The goal of the two-year interim Waivers is to build capacity of local coalitions, engage with individual dischargers, and initiate data collection, all of which are aspects of the foundation for the long-term program (CRWQCB 2003).

INTRODUCTION

In conjunction with the resolution, the Regional Board executed an interagency agreement with UC Davis Aquatic Toxicology Laboratory in November 2002 to conduct an evaluation of water

quality of agricultural drains throughout the Central Valley, which is considered Phase I of the program. The water was evaluated primarily through the use of aquatic species toxicity testing in a limited number of agricultural drains in the San Joaquin River and Sacramento River watersheds. Phase II of the program was contracted to UC Davis Aquatic Ecosystem Analysis Laboratory and the California Department of Fish and Game (CDFG).

Phase II of the program includes the following objectives:

- Evaluation of water quality by using chemical analysis and toxicity testing in a number of agricultural drains in the Central Valley
- Identification of the causes (e.g. sediment, contaminants, salt, pesticides) of any water quality impairment
- Determination of the sources of contaminants based on the identified causes of impairments
- Use of the data and information gained in this program for recommending use of management practices and future assessment of agricultural runoff and drainage waters.

For Phase II selected sites are sampled for chemical analysis, water and sediment toxicity during the storm season (December through February) and the irrigation season (March through September). The sampling is anticipated to occur during the first 24 months of the Phase II program, the third year will be used for data management and reporting.

The primary criteria for site selection are: (1) Drainage dominated by agricultural irrigation return flow (2) Land use patterns surrounding the site predominated by agricultural activities, and (3) Site is at a location near where the drainage water is discharged into a creek or river.

DESCRIPTION OF STUDY AREA

The Central Valley, lying between the Sierra Nevada and the Coast Ranges in central California, is California's agricultural heartland. With its long growing season and fertile soil, the valley has the largest single concentration of fruit and nut farms and vineyards in the United States; cotton, grain and vegetables are also grown. Precipitation ranges from 30 in. (76 cm) in the north to 6 in. (15.2 cm) in the south. Two thirds of the valley's agricultural land is in the south, while two thirds of its water is in the north. The Central Valley project addresses this problem by bringing water from the Sacramento basin in the north into the San Joaquin Valley in the south.

Sampling sites for the Irrigation Monitoring Phase II Agricultural Waiver Program were chosen from as far North as Redding and reaching down South to the Tulare Basin (Table 1).

Thirty sites were sampled during the irrigation monitoring season between June 13, 2005 and August 3, 2005. Each site was scheduled to be sampled once every two weeks, for a maximum of four samples per site (Table 2). One site, Drain to Walker Creek at County Road D (CS22) was dry during the first three sample periods and was, subsequently, cancelled for the fourth period. Drain to Walker Creek at County Road F (CS24) was added in the middle of the season and only sampled during the last two periods. Spring Creek at East Camp Road (CS23) was dry during the final round of sampling.

Roberts Island Drain at Woodsbro (SJC517) was not accessible during the first two sampling visits. A reduced sampling effort that consisted only of pesticide screening was performed on 3 occasions at two sites due to low flows, puddle-like, and standing water conditions. The sites and dates of pesticide screening were: Drain to Wooten Creek east of Hill Road on the north side of the Creek (FT19) on July 18 and August 2 and Elk Bayou above Tule River channel at Road 96 (FT24) on July 6.

Table 1. Irrigation season 2005 monitoring sites. Site ID is used throughout the report to refer to specific sites

Site ID	Site Name	County	Latitude	Longitude
CS01	Tributary of Home Colony Canal at Hwy 99	Tehama/Glenn	39.78424	-122.19756
CS06	Comanche Creek (Angel Slough) at Dayton Rd.	Butte	39.70007	-121.84974
CS11	Bear River at Pleasant Grove Rd.	Sutter	38.98401	-121.48739
CS12	Unnamed drain to Walker Creek at Co. Rd. 28	Glenn	39.66846	-122.22385
CS15	Spring Creek at Walnut Drive.	Colusa	39.11954	-122.19431
CS22	Drain to Walker Creek at Co. Rd. D	Glenn	39.68472	-122.25194
CS23	Spring Creek at E. Camp Rd.	Colusa	39.10854	-122.21191
CS24	Drain to Walker Cr at County Rd F	Glenn	39.67422	-122.23443
SS05	North Main Canal at Sankey Rd.	Sutter	38.77978	-121.53259
SS09	N-S Ditch along Natomas Rd	Sutter	38.74504	-121.49388
NSJ04	Calaveras River at Clements Rd.	San Joaquin	38.04563	-121.07661
NSJ28	Pixley Slough at Eightmile Rd.	San Joaquin	38.05779	-121.31487
NSJ31	Calaveras River at Pezzi Rd.	San Joaquin	38.04513	-121.20127
NSJ32	Bear Creek at Alpine Rd.	San Joaquin	38.07402	-121.21093
NSJ34	Bear Creek at Harney Ln.	San Joaquin	38.10171	-121.17775
NSJ36	Pixley Slough at Ham Ln.	San Joaquin	38.07428	-121.28752
NSJ38	Paddy Creek at Jack Tone Rd.	San Joaquin	38.10171	-121.17775
SJC516	Unnamed Canal at Howard Rd. east of Stark Rd.	San Joaquin	37.87669	-121.37689
SJC517	Mid Roberts Island Drain at Woodsbro	San Joaquin	37.94163	-121.36930
FT05	Button Ditch at Ave 358	Tulare	36.45857	-119.39918
FT18	Drain to Fink Ditch, North side of Central Ave., drain is on west side of ditch	Fresno	36.69134	-119.46626
FT19	Drain to Wooten Creek east of Hill Rd. on the north side of the Creek	Fresno	36.62834	-121.34033
FT23	St. Johns River at Road 108	Tulare	36.37415	-119.33249
FT24	Elk Bayou above Tule River channel at Road 96.	Tulare	36.12429	-119.35779
FT25	Melga Canal near Tulare lake bottom.	Kings	36.24030	-121.62544
FT31	Peoples Ditch west of 10th and Elder Ave.	Kings	36.38664	-119.63873
SSJ03	Berenda Creek at Ave. 17.5	Madera	37.00489	-120.23791
SSJ04	Island Field Drain on Catrina Rd.	Merced	37.06165	-120.57333
SSJ07	Boundary Drain at Henry Miller Ave.	Merced	37.09898	-120.77895
SSJ10	Owens Creek at Gurr Rd.	Merced	37.23539	-120.56072

Sediment samples were collected once during the 2005 irrigation season. Samples were collected by both UCD and UC Berkeley. Thirty-four sites were sampled for sediment toxicity (Table 3). Sediment samples were collected at some of the same locations as the water samples (n=22). Thirteen sites were selected by UCB and were only sampled for sediment. To maintain consistency of the quality of all sediment samples, ten samples from Fresno-Tulare (FT05, FT24, FT25, FT31, FT18, FT19) and South San Joaquin (SSJ10, SSJ07, SSJ04, SSJ03) basins were replaced by samples taken by UCB. UCB also made the decision not to analyze the sediment sample from St. John's River at Road 108 (FT23).

Table 2. Sampling frequencies of Ag Waiver Phase II Monitoring Sites
(start date for each interval in parentheses)

Site ID	Interval #1 6/13/2005	Interval #2 6/27/2005	Interval #3 7/11/2005	Interval #4 7/25/2005
CS01				
CS06				
CS11				
CS12				
CS15				
CS22	6/13/2005	6/27/2005	7/11/2005	/ / / / / / / / / / /
CS23				7/26/2005
CS24*				
SS05				
SS09				
NSJ04				
NSJ28				
NSJ31				
NSJ32				
NSJ34				
NSJ36				
NSJ38				
SJC516				
SJC517	/ / / / / / / / / / /	/ / / / / / / / / / /		
FT05				
FT18				
FT19			7/18/2005	8/2/2005
FT23				
FT24		7/6/2005		
FT25				
FT31				
SSJ03				
SSJ04				
SSJ07				
SSJ10				

*Added beginning with Interval #3

	Dry
/ / / / / / / / / / /	Not sampled: cancelled, site inaccessible
	Pesticide screening only

Table 3. Irrigation season 2005 sediment monitoring sites. Site ID is used throughout the report to refer to specific sites

Site ID	Site Name	County	Latitude	Longitude
CS06	Comanche Creek (Angel Slough) at Dayton Rd.	Butte	39.70014	-121.84878
CS11	Bear River at Pleasant Grove Rd.	Sutter	38.98464	-121.48647
CS12	Unnamed drain to Walker Creek at Co. Rd. 28	Glenn	39.66846	-122.22385
CS15	Spring Creek at Walnut Drive.	Colusa	39.11975	-122.19318
SS05	North Main Canal at Sankey Rd.	Sutter	38.77978	-121.53259
SS09	N-S Ditch along Natomas Rd	Sutter	38.74504	-121.49380
NSJ28	Pixley Slough at Eightmile Rd.	San Joaquin	38.05765	-121.31350
NSJ31	Calaveras River at Pezzi Rd.	San Joaquin	38.04536	-121.19982
NSJ32	Bear Creek at Alpine Rd.	San Joaquin	38.07402	-121.21093
SJC516	Unnamed Canal at Howard Rd. east of Stark Rd.	San Joaquin	37.87696	-121.37656
SJC517	Mid Roberts Island Drain at Woodsbro	San Joaquin	37.94163	-121.36930
FT03	Elbow Creek at Road 112 North of Visalia	Tulare	36.40293	-119.32213
FT05*	Button Ditch at Ave 358	Tulare	36.45856	-119.39828
FT18*	Drain to Fink Ditch, North side of Central Ave., drain is on west side of ditch	Fresno	36.69138	-119.46543
FT19*	Drain to Wooten Creek east of Hill Rd. on the north side of the Creek	Fresno	36.38505	-119.27781
FT23**	St. Johns River at Road 108	Tulare	36.37453	-119.33127
FT24*	Elk Bayou above Tule River channel at Road 96.	Tulare	36.12429	-119.35671
FT25*	Melga Canal near Tulare lake bottom.	Kings	36.24044	-119.62431
FT31*	Peoples Ditch west of 10th and Elder Ave.	Kings	36.38668	-119.63774
SSJ03*	Berenda Creek at Ave. 17.5	Madera	37.00448	-120.23746
SSJ04*	Island Field Drain on Catrina Rd.	Merced	37.06142	-120.57228
SSJ07*	Boundary Drain at Henry Miller Ave.	Merced	37.09884	-120.77777
SSJ10*	Owens Creek at Gurr Rd.	Merced	37.23534	-120.55953
SSI	Unnamed Drain Along Sutter Island X Rd.	Sacramento	39.18127	-121.66233
SLO	Live Oak Slough @ Eager Rd	Sutter	38.29572	-121.59263
SED15	Ditch on S. side of Utica Avenue	Kings	35.93418	-119.62700
SED17	Farmer's Ditch at Rt. 137 (Tulare Avenue)	Tulare	36.20884	-119.26043
SED18	KaweahRiver at Road 168	Tulare	36.34764	-119.19679
SED19	King Ditch at Avenue 368 & Road 60	Tulare	36.46521	-119.43875
SED20	Knestirc Dtich at Rt. 201 (Avenue 400)	Tulare	36.51731	-119.43939
SED22	Murphy Slough at Elm	Fresno	36.46018	-119.79870
SED23	South Channel of Turner Ditch at Marks (aka 22nd Ave)	Fresno	36.43879	-119.84986
SED24	Stinson Ditch at Kamm	Fresno	36.53146	-120.11618
SED25	PoSo Slough at Hudson	Fresno	36.97646	-120.54536
SED26	Holland Drain at Hudson	Fresno	36.92490	-120.54709

*Sediment sample taken by UCD replaced with sample taken by UC Berkeley

**Sediment sample taken by UCD not analyzed

METHODS

FIELD METHODS

Discrete water samples were collected for analysis of concentrations of various pesticides, metals and nutrients, of toxicity and of physical parameters (Table 4). In addition to the surface water samples, sediment samples were collected.

Table 4. Summary of Sample Container, Volume, Initial Preservation and Holding Time Recommendations for Water and Sediment Samples

Parameters for Analysis in WATER Samples	Recommended Containers (all containers pre-cleaned)	Typical Sample Volume (ml)	Initial Field Preservation	Maximum Holding Time (analysis must start by end of max)
Physical Parameters[1]				
Color	1 liter glass or polyethylene	500 ml	Cool to 4°C, dark	48 hours at 4°C, dark
Turbidity	"	150 ml	"	48 hours at 4°C, dark
Total Dissolved Solids (TDS)	"	1000 ml	"	7 days at 4°C, dark
Nutrients[1]				
Ortho-phosphate ($O\text{-}PO_4$)	Trace clean and certified polyethylene	100 ml	Cool to 4°C, dark	48 hours at 4°C, dark
Nitrate + Nitrite ($NO_3 + NO_2$)	"	150 ml	"	Recommend 48 hours at 4°C, dark or If preserved, H_2SO_4 pH<2 28 days, either one at 4°C, dark
Nitrite (NO_2)	"	150 ml	"	48 hours at 4°C, dark
Total Keldjahl Nitrogen (TKN)	"	600 ml	"	Recommend 48 hours at 4°C, dark or If preserved, H_2SO_4 pH<2 Recommend: 7 days Maximum: 28 days Either one at 4°C, dark
Ammonia (NH_3)	"	500 ml	"	Recommend 48 hours at 4°C, dark or If preserved, H_2SO_4 pH<2 Recommend: 7 days Maximum: 28 days Either one at 4°C, dark

(1) NOTE:
The volume of water necessary to collect in order to analyze for the above constituents is typically combined in multiple 1-liter polyethylene bottles, which also allows enough volume for possible re-analysis and for conducting lab spike duplicates. This is possible since the same laboratory is conducting all of the above analyses; otherwise, individual volumes apply.

Table 4. Summary of Sample Container, Volume, Initial Preservation, and Holding Time Recommendations for Water Samples (Continued)

Parameters for Analysis in WATER Samples	Recommended Containers (all containers pre-cleaned)	Typical Sample Volume (ml)	Initial Field Preservation	Maximum Holding Time (analysis must start by end of max)
TOC and THMs in Drinking Water and Surface Water				
Total Organic Carbon (TOC)	40 ml glass vial	40 ml (one vial)	Cool to 4°C, dark	28 days at 4°C, dark
Trihalomethanes (chloroform, bromoform, dibromochloromethane, bromodichloromethane)	40 ml VOA vials	120 ml (three VOA vials)	Cool to 4°C, dark	14 days at 4°C, dark
Trace Elements in Water Samples				
TOTAL ELEMENTS (As, B, Cd, Cu, K, Ni, P, Pb, Se, Zn)	60 ml polyethylene bottle, pre-cleaned in lab using HNO_3	60 ml (one bottle)	Cool to 4°C, dark. Acidify in lab within 48 hrs, with ultra-pure HNO_3 for pH<2.	Once sample is acidified, can store up to 6 months at room temperature
HARDNESS	200 ml polyethylene or glass bottle	200 ml (one bottle)	Cool to 4°C, dark	48 hours at 4°C, dark
Synthetic Organic Compounds in Water Samples				
PESTICIDES & HERBICIDES* □Organophosphate Pesticides □Organochlorine Pesticides □Carbamates □Pyrethroids □Herbicides	1-L I-Chem 200-series certified trace clean amber glass bottle, with Teflon lid-liner (per each sample type)	1000 ml (one container) *Each sample type requires 1000 ml in a separate container	Cool to 4°C, dark If chlorine is present, add 0.1g sodium thiosulfate	Keep at 4°C, dark, up to 7 days. Extraction must be performed within the 7 days; analysis must be performed within 40 days of extraction.
Toxicity Testing - Water Samples				
TOXICITY IN WATER	Four 2.25 L I-Chem 200-series certified amber glass bottles	9000 ml	Cool to 4°C, dark	36 hours at 4°C, dark
Sediment Toxicity - Sediment Samples				
TOXICITY IN SEDIMENT	Four L I-Chem 200-series certified clear glass jugs	3000 ml	Cool to 4°C, dark	One week at 4°C, dark

The samples were collected following the Standard Operating Procedures included in the Quality Assurance Project Plan developed for the Agricultural Waiver Monitoring Program. The samples were put on ice immediately after collection. The Water Column Toxicity samples were delivered to AQUA-Science Environmental Toxicology Consultants. Metal samples were delivered to the Department of Fish & Game Marine Pollution Studies Laboratory in Moss Landing every two weeks (at the end of each sampling interval). The TOC samples were delivered to the UC Davis Department of Civil and Environmental Engineering until (and including samples taken on) July 14. TOC samples from July 18 and on were delivered to the Department of Fish and Game Water Pollution Control Laboratory. All other samples were analyzed at the Department of Fish and Game Water Pollution Control Laboratory in Rancho Cordova.

Temperature, pH, electrical conductivity (EC) and dissolved oxygen (DO) were measured using Oakton* pH/Con 10 Multiparameter Meter and Fisherbrand* Traceable Dissolved Oxygen Meter. Field measurements, weather and water conditions were noted on field sheets as well as the sampling time, the number of collected samples and quality control samples.

Velocity (Table 5) was measured by wading. USGS Type AA-MH-Model 6215 Current Meters for normal velocities were used to determine the stream velocities.

Discharge was measured following the standard method described in USDA Technical Report RM-245. For velocity that was measured in a channel, the currently recommended mid-section method by the U.S. Geological Survey was used to compute discharge (Harrelson 1994).

In several of the sample sites, the depth and flow of the channel prohibited velocity estimation by the standard wading method.

Table 5. Summary of discharge (ft^3/s) measured during Irrigation season 2005

Site ID	Interval #1 June 13-26	Interval #2 June 27-July 10	Interval #3 July10-24	Interval #4 July 25-Aug 7
CS01	27.76	NA	14.48	NA
CS06	81.32	81.01	76.85	79.87
CS11[1]	238	217.68	146	20.8
CS12	2.79	3.97	NA	NA
CS15	11.79	28.45	4.18	NA
CS23	2.35	4.09	3.15	NA
CS24	NA	NA	NA	21.59
SS05	NA	70.28	62.57	NA
SS09	11.2	5.67	NA	NA
NSJ04	NA	30.28	31.99	30.27
NSJ28	NA	62.39	48.47	4.77
NSJ31	NA	5.94	8.04	8.74
NSJ32	NA	NA	NA	NA
NSJ34	NA	1.72	0.15	NA
NSJ36	NA	75.9	41.56	2.46
NSJ38	NA	NA	NA	NA
SJC516	NA	NA	NA	NA
SJC517	NA	NA	NA	88
FT05	21.59	4.91	8.13	15.51
FT18	13.53	16.8	12.67	14.72
FT19	NA	NA	NA	NA
FT23	NA	NA	NA	NA
FT24	4.76	NA	2.62	NA
FT25	NA	NA	130.1	145.85
FT31	73.94	88.48	62.15	69.19
SSJ03	15.99	14.01	24.01	14.95
SSJ04	7.56	17.32	15.65	10.11
SSJ07	NA	NA	NA	NA
SSJ10	44.05	2.25	14.98	20.1

[1] Discharge values obtained from the Bear River at Pleasant Grove Road CDWR Gage.

NA: Discharge values were not applicable due to one or more reasons:

1) Site was not sampled during that interval

2) Site was dry

3) Conditions were unsafe to sample

4)Flow was below the Rating Limit of the meter

ANALYTICAL METHODS

Organic Analytical Methods

Volatile Organic Compounds (EPA 8260)

The volatile compounds were introduced into the gas chromatograph (GC) by the purge-and-trap method. Samples were transferred to a purge and trap sparger and purged with inert gas. The target analytes were trapped during the purge cycle on a Tenax trap. After the purge cycle was completed, the Tenax trap was heated and the analytes were introduced directly into a capillary column for analysis. The (GC) column was temperature-programmed to separate the analytes, which were then detected with a mass spectrometer (MS) interfaced to the gas chromatograph (GC). Analytes eluted from the capillary column were introduced into the MS via direct connection. Identification of target analytes was accomplished by comparing their retention time and mass spectra with the retention time and electron impact spectra of authentic standards. Quantitation was accomplished by comparing the response of a major (quantitation) ion relative to an internal standard using a five-point calibration curve.

Pesticide/herbicide Analytical Methods

Sample Extraction for Organochlorines, Organophosphorus, Triazines, Selective Herbicides, and Pyrethroids – EPA 3510C

A measured volume of sample (1.0 L) was extracted with methylene chloride (DCM) using a separatory funnel (liq/liq technique). The DCM extract was dried with sodium sulfate, evaporated using a Kuderna-Danish (K-D) apparatus and solvent exchanged into petroleum ether. The extract was concentrated using a micro-snyder (micro K-D) apparatus to approximately 1.0 ml and finally adjusted to 2.0 ml with iso-octane.

Sample Preparation for Selective Herbicides – EPA 3535

A measured volume of sample (1.0 L) was acidified with sulfuric acid: DI water (1:1) to pH $\leq$ 2, the acidified sample was then eluted through a pre-conditioned C18 (Sep-Pak) column. The target herbicides were eluted from the C18 column with 2.0 ml methanol.

Sample Preparation for Carbamates – EPA 3510CM

A measured volume of sample (1.0 L) was extracted with methylene chloride (DCM) using a separatory funnel. The DCM extract was dried with sodium sulfate, evaporated to almost dryness using rotary evaporator and finally adjusted to 2.0 ml with methanol.

Instrumentation Methods

Organochlorines Pesticides – EPA 8081AM

Organochlorines were analyzed using an Agilent 6890 plus, equipped with two micro ECD detectors, EPC split-splitless injector, Agilent auto-sampler and dual 60 meter capillary columns (DB5 and DB17)(0.25 mm ID and 0.25 µm film thickness) connected to a single injection port using a "Y" fit connector.

Organophosphorus Pesticides – EPA 8141AM
The samples were analyzed using an Agilent 6890 plus, equipped with two FPD detectors in phosphorous mode, EPC split-splitless injector, Agilent auto-sampler and dual 60 meter capillary columns (DB5 and DB17) (0.25 mm ID and 0.25 µm film thickness) connected to a single injection port using a "Y" fit connector.

Triazines – EPA 619 M
Triazine herbicides were analyzed using a GC Varian 3600, equipped with two TSD detectors, 7890 injector, 8200 autosampler and dual 30 meter capillary columns (DB5 and DB17) (0.25 mm ID and 0.25 µm film thickness) connected to a single injection port using a "Y" fit connector.

Selective Herbicides – EPA 1656M
Some herbicides were analyzed using an Agilent 1100 high performance liquid chromatograph/mass spectrometer (HPLC-MS) using atmospheric pressure electrospray ionization in negative and/or positive mode.

Glyphosate/AMPA – EPA 547
The samples were analyzed by direct injection using a Hewlett Packard 1100 HPLC equipped with post column derivatization, and fluorescence detector.

Pyrethroids – EPA 1660M
Pyrethroids were analyzed using an Agilent 6890 plus, equipped with two micro ECD detectors, EPC split-splitless injector, Agilent auto-sampler and dual 60 meter capillary columns (DB5 and DB17)(0.25 mm ID and 0.25 µm film thickness) connected to a single injection port using a "Y" fit connector.

Carbamates – EPA 632M
Carbamates were analyzed by Agilent 1100 liquid chromatograph/mass spectrometer (HPLC-MS) using atmospheric pressure electrospray ionization in positive mode.

Inorganic Analytical Methods

Trace Elements by ICP-MS – EPA 1638

Inductively coupled plasma-mass spectrophotometer was used in the analysis of water samples. No digestion was required prior to analysis for dissolved elements in water samples. The method measures ions produced by a radio frequency inductively coupled plasma. Analyte species originating in a liquid were nebulized and the resulting aerosol transported by plasma gas and introduced by means of an interface into a mass spectrometer. The ions produced in the plasma were sorted according to their mass-to charge ratios and quantified with a channel electron multiplier. Interferences were assessed and valid corrections applied or the data was flagged to indicate problems. Interference correction included compensation for background ions contributed by the plasma gas, reagents, and constituents of the sample matrix.

Samples were run with no dilution. Standard curves were run for all elements of concern. All samples, standards, SRM's, and blanks were made up in a 1-2 % Nitric acid solution. Blanks, standard reference materials, matrix spikes and calibration standards were run with all samples.

Ammonia – EPA 350.3

Ammonia was determined by use of an ion selective electrode (ISE) specific for the ammonium ion. The electrode used a hydrophobic, gas permeable membrane, which separated the sample from an internal ammonium chloride solution. The sample ammonia diffused through the membrane and adjusted the pH of the internal solution. This change was translated into a relative millivolt reading displayed on the pH/ISE meter.

Color - SM 2120B BM

Color was determined using an automated colorimetric method equivalent to the visual comparison method, SM 2120B. Potassium hexachloroplatinate and cobalt(II) chloride hexahydrate were used to prepare the color standards. The samples and standards were buffered at pH 6.8 during analysis and the product read at 410nm. Because color is pH dependent, the pH at which color was determined was reported with results.

Ortho-phosphate – EPA 365.1 M

Ortho-phosphate was determined using an automated colorimetric method accomplished by flow injection analysis. The ortho-phosphate in the sample reacted with ammonium molybdate and antimony tartrate under acidic conditions. The product was then reduced by ascorbic acid to produce a blue color read at 880nm.

Nitrate + Nitrite as N – EPA 353.2

Nitrate plus nitrite was determined using an automated colorimetric method accomplished by flow injection analysis. The sample was passed through a cadmium column and the nitrate reduced to nitrite. The nitrite then reacted with sulfanilamide and N-(1-naphthyl) ethlyenediamine dihydrochloride forming a pink color which was read at 520 nm.

TDS – SM 2540 C

A representative sample aliquot was filtered through a glass fiber filter. The filtrate was then evaporated in a pre-weighed dish and then dried to constant weight at 180°C. The difference between the final dish weight and initial dish weight represented the total dissolved solids.

Turbidity – SM 2130B

The method was based upon a comparison of the intensity of light scattered by a sample under defined conditions with the intensity of light scattered by a standard reference suspension of formazin.

Hardness – SM 2340C

Hardness was defined as the sum of the calcium and magnesium concentrations, both expressed as calcium carbonate in mg/L. The sample with Calmagite indicator was pink in color when buffered to pH 10.0. EDTA was added as the titrant, and the Calmagite complexes of calcium and magnesium dissociated to form their more stable EDTA complex. At the end point, the

solution turns blue as a result of the dissociated Calmagite. The amount of EDTA used therefore provides a measure of calcium and magnesium in the water.

Table 6 summarizes the analytical methods and laboratory detection and reporting requirements for all the constituents except Water Column Toxicity and Sediment Toxicity.

Sediment Pesticide analysis

The extraction method for the sediment was a modification of USEPA Method #3550, Sonication Extraction for low concentrations of organics and pesticides. Approximately 20 g (±1.0 g) of sediment were removed, spiked with 50ng each of surrogates, dibromooctoflourobiphenyl (DBOFB) and decachlorobiphenyl (DCBP) and dried with anhydrous magnesium sulfate. In case of high sulfur content sediment, 2g of activated copper metal were added to remove sulfur residue. The sample was sonicated with 50 ml of 50:50 methylene chloride:acetone (v/v) for 5 minutes in 3 s pulse mode using a high intensity ultrasonic processor (Model VCX 400, Sonics and Materials Inc., Newtown, CT, USA), decanted and filtered through a Whatman No. 41 filter paper filled with anhydrous magnesium sulfate. This procedure was repeated twice more with a sonication time of 3 minutes. The extract was then collected in an evaporative tube and reduced in volume to approximately 5 ml, under a stream of nitrogen in a TurboVap II evaporator (Zymark, Hopkinton, MA). After cooling, the extract was solvent exchanged with hexane and the volume further reduced to 2 ml.

A deactivated Florisil column was used to remove interference from the extract. The column was packed with 10g Florisil partially deactivated by mixing with distilled water (6% w/v) and a 1cm layer of anhydrous sodium sulfate was used to cap the Florisil. After the concentrated extract was transferred into the Florisil column, pesticides were eluted from the column with 50 mL of 30% diethyl ether in hexane solution (v/v). The eluent was concentrated, dissolved in 2 mL of hexane and transferred to clean screw-cap vials, sealed with a Teflon lined lid and stored at -4°C until analysis on the GC. Additional dilution steps may have been needed for some field-collected agricultural samples due to elevated pesticide concentrations.

Sediment samples were analyzed for the following pesticides: alpha-, beta-, delta-, and gamma-BHC, alpha- and gamma-chlordane, aldrin, endosulfan I and II, endosulfan sulfate, dieldrin, endrin, endrin aldehyde, endrin ketone, heptachlor, methoxychlor, heptachlor epoxide, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, chlorpyrifos, *cis* and *trans* –permethrin, bifenthrin, esfenvalerate lambda-cyhalothrin, cypermethrin, cyfluthrin, and deltamethrin. The detection limit for all analytes was 1 ng/g (or less if determined achievable in preliminary tests). The method validation was conducted with control sediment spiked with each of the target pesticides. Analyses were conducted using a Hewlett Packard 6890 Series Gas Chromatograph System (HP6890GC) equipped with an electron capture detector (ECD).

<u>Metals analysis</u>
Analysis for metals was performed on those samples determined to be toxic and an equal number of randomly selected non-toxic samples. The total number of samples selected for metals analysis did not exceed 50% of the samples collected. Analyses were done by ICP for Al, As,

Cu, Cd, Cr, Ni, Pb, Se and Zn. Detection limits for these analytes range from 1-5 mg/kg (except 20-25 mg/kg for Al and Se). Analytical work was performed by the Department of Fish & Game Marine Pollution Studies Laboratory in Moss Landing.

Toxicity Testing Methods

Aqua Sciences conducted water column toxicity testing during the irrigation season. Acute toxicity testing was conducted using the invertebrate *Ceriodaphnia dubia* and the larval fathead minnow *Pimephales promelas* according to standard USEPA (2002a) acute toxicity methods. In addition to identifying toxicity caused by herbicides, 96-hour tests with the green algae *Selenastrum capricornutum* were conducted according to standard USEPA (2002b) methods.

Grain Size analysis

The sediment was washed on a series of stacked brass or stainless steel sieves (1000, 500, 250, 125, and 63 µm), and the material passing through the smallest sieve collected in a large stainless steel bowl. The contents of each sieve were transferred to an aluminum pan, dried at 100^{o}C overnight and weighed. The contents of the bowl (representing the silt and clay fraction) were allowed to settle for 24-48 hr, the overlying water poured off, and the particles transferred to an aluminum pan for drying and weighing.

Toxicity testing

Sediment toxicity was assessed using a 10-day survival and growth test with *Hyalella azteca* (EPA 600/R-99/064). U.S. EPA, as a standard test for sediment toxicity testing has promulgated this test.

CNH analysis

Inorganic carbon was removed from the sample by: 1) drying at 100^{o}C overnight; 2) grinding the sample with a mortar and pestle; 3) exposure to hydrochloric acid vapors overnight); 4) driving off re-adsorbed water by drying at 100^{o}C for 2-4 hr; and 5) storage of sample at –20^{o}C or in a dessicator until analysis. CHN analysis ere done by the Horn Point Environmental Laboratory, University of Maryland, Cambridge, MD using a CE-440 Elemental Analyzer from Exeter Analytical.

Table 6. Laboratory Detection and Reporting Limit Requirements

MediumName	MethodName	AnalyteName	FractionName	Units	ChemAgency Code	MDL	RL	INSTRUMENTATION
GENERAL PARAMETERS								
samplewater	SM 2120B Mod	Color	None	Color Units	DFG-WPCL	2.0	5.0	FIA
samplewater	SM 2130B	Turbidity	None	NTU	DFG-WPCL	1	1	Nephelometer
samplewater	SM 2540C	Solids	Total Dissolved	mg/L	DFG-WPCL	10	10	
samplewater	EPA 415.1	Organic Carbon	Total	mg/L	DFG-WPCL	0.2	0.5	
PATHOGENS								
samplewater	Quantitray	E Coli	None	MPN/100mL	Contract Lab			
TRIHALOMETHANES (THM)								
samplewater	EPA 8260	Chloroform	None	µg/L	DFG-WPCL	0.05	2	GC-MS/Purge and Trap
samplewater	EPA 8260	Bromoform	None	µg/L	DFG-WPCL	0.2	2	GC-MS/Purge and Trap
samplewater	EPA 8260	Dibromochloromethane	None	µg/L	DFG-WPCL	0.08	2	GC-MS/Purge and Trap
samplewater	EPA 8260	Bromodichloromethane	None	µg/L	DFG-WPCL	0.06	2	GC-MS/Purge and Trap
TRACE ELEMENTS								
samplewater	EPA 1638	Arsenic	Dissolved/Total	µg/L	MPSL-DFG	0.10	0.30	ICP-MS
samplewater	EPA 1638	Boron	Dissolved/Total	µg/L	MPSL-DFG	1	5	ICP-MS
samplewater	EPA 1638	Cadmium	Dissolved/Total	µg/L	MPSL-DFG	0.002	0.01	ICP-MS
samplewater	EPA 1638	Copper	Dissolved/Total	µg/L	MPSL-DFG	0.003	0.01	ICP-MS
samplewater	EPA 1638	Lead	Dissolved/Total	µg/L	MPSL-DFG	0.006	0.01	ICP-MS
samplewater	EPA 1638	Nickel	Dissolved/Total	µg/L	MPSL-DFG	0.006	0.02	ICP-MS
samplewater	EPA 1638	Phosphorous	Dissolved/Total	µg/L	MPSL-DFG	1.0	3.0	ICP-MS
samplewater	EPA 1638	Selenium	Dissolved/Total	µg/L	MPSL-DFG	0.10	0.30	ICP-MS
samplewater	EPA 1638	Zinc	Dissolved/Total	µg/L	MPSL-DFG	0.02	0.06	ICP-MS
INORGANIC (CONVENTIONAL ANALYTES)								
samplewater	EPA 350.3	Ammonia as N	None	mg/L	DFG-WPCL	0.04	0.1	ISE
samplewater	EPA 351.2	Nitrogen as N, Total Kjeldahl (TKN)	None	mg/L	DFG-WPCL	0.12	0.25	FIA
samplewater	EPA 353.2	Nitrate+nitrite as N	None	mg/L	DFG-WPCL	0.005	0.01	FIA
samplewater	EPA 353.2	Nitrite as N	None	mg/L	DFG-WPCL	0.005	0.01	FIA
samplewater	EPA 365.1Mod	Phosphate as P, Ortho	None	mg/L	DFG-WPCL	0.005	0.01	FIA
ORGANOCHLORINE PESTICIDES								
samplewater	EPA 608/8081A	DDD(o,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDD(p,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDE(o,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS

Table 6. Laboratory Detection and Reporting Limit Requirements (Continued)

MediumName	MethodName	AnalyteName	FractionName	Units	ChemAgency Code	MDL	RL	INSTRUMENTATION
samplewater	EPA 608/8081A	DDE(p,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDT(o,p')	None	µg/L	DFG-WPCL	0.001	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	DDT(p,p')	None	µg/L	DFG-WPCL	0.002	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Dicofol	None	µg/L	DFG-WPCL	0.05	0.1	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Dieldrin	None	µg/L	DFG-WPCL	0.001	0.002	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Endrin	None	µg/L	DFG-WPCL	0.002	0.005	GC-ECD/GC-MS
samplewater	EPA 608/8081A	Methoxychlor	None	µg/L	DFG-WPCL	0.001	0.002	GC-ECD/GC-MS
HERBICIDES								
samplewater	EPA 619	Atrazine	None	µg/L	DFG-WPCL	0.02	0.05	GC-NPD/GC-MS
samplewater	EPA 619	Cyanazine	None	µg/L	DFG-WPCL	0.02	0.05	GC-NPD/GC-MS

QUALITY ASSURANCE PROCEDURES

Quality assurance samples were collected and analyzed to guarantee that the data generated during the analytical phase of the project fulfill Quality Control specifications for precision, accuracy, representativeness, comparability and completeness (PARC). Three types of quality assurance samples were evaluated: field blanks, field duplicates and matrix spike samples.

Field blanks were generated to demonstrate that neither the sampling procedures nor atmospheric exposure resulted in contaminated samples. Field blanks were collected at a rate of 5% of the total number of samples along with the associated environmental sample. Field blanks were assigned randomly to sampling sites and were distinguished from the environmental sample through a time offset of 1 minute. Water used for the blanks consisted of deionized water from the Aquatic Biology and Environmental Sciences Building at UC Davis for all blanks except the blanks established for metals and water column toxicity. MilliQ water was used for the metal samples, and tap water from Aqua Science for the toxicity samples. For metals, there is also a travel blank. A travel blank is prepared by filling a sample vial with MilliQ water (in a clean room with minimal chance of contamination) the day prior to sampling and then during sampling, it is stored in a cooler, on ice, as with any other sample. The travel blank indicates whether storage or transportation contaminates the sample.

Field duplicate samples demonstrate the precision of the analytical process. Duplicates were collected in rapid succession and in an identical manner to the associated environmental sample. Duplicates were collected at a rate of 5% of the total samples and were assigned randomly to sample sites. Duplicates were distinguished from the environmental sample through a time offset of 3 minutes. For cases where contaminants were detected in both samples, the assessment of the difference in concentration between the environmental sample and the paired replicate was determined by calculating the relative percent difference between the two values, which is defined as:

$$RPD = (([C_{env} - C_{rep}] / ([C_{env} + C_{rep}]/2)) * 100$$

RPD = the relative percent difference

C_{env} = concentration of pesticide in environmental sample

C_{rep} = concentration of pesticide in replicate sample.

If an RPD greater than 25% is confirmed by reanalysis, the environmental results were qualified as estimated.

The purpose of analyzing matrix spikes and matrix spike duplicates was to demonstrate the performance of the analytical method in a particular sample matrix. Matrix spike and matrix

spike duplicate samples were collected at a rate of 5%, assigned randomly to sites and labeled with a time offset of 9 minutes. Recovery is the accuracy of an analytical test measured against a known analyte addition to a sample.

Recovery is calculated as follows:

Recovery = ((Matrix plus spike result – Matrix result) * 100) / expected Matrix plus spike result

If matrix spike recovery of any analyte was outside of the acceptable range, the result was determined to have failed the acceptance criteria (80-120%).

RESULTS

PESTICIDES

A total of one hundred and eleven surface water samples were collected for each of seven pesticide groups (Table 7-13): organochlorine pesticides (OCH), organophosphate pesticides (OP), carbamates, herbicides, pyrethroids, acaricides, and fungicides. The frequency of detection varied from 0-25% (Table 14). Chlorpyrifos (25%) was the most commonly detected pesticide, followed by metolachlor (24%), trifluralin (18%), dimethoate (14%), and diuron (10%). Individual concentrations of pesticides varied from detectable levels to 150 µg/L of thiobencarb at North Main Canal at Sankey Road (SS05).

Herbicides (Table 7) were detected in 45 samples (41%) and were the most commonly detected class of pesticides. Herbicides were found in all five basins that were sampled: north Sacramento, central Sacramento, north San Joaquin, south San Joaquin, and Fresno-Tulare. Metolachlor (24%), trifluralin (18%), and diuron (10%) were the most common herbicides. A maximum concentration of metolachlor (3.37 µg/L) was found at Spring Creek at East Camp Road (CS23). The highest concentration of trifluralin (0.643 µg/L) was detected at Island Field Drain on Catrina Road (SSJ04). Diuron was found at the Drain to Wooten Creek east of Hill Road (FT19) with a maximum concentration of 0.692 µg/L. The water samples were analyzed for a total of twenty-three herbicides, with sixteen of those being additional herbicides that were screened only. Although the analyses for these sixteen additional herbicides are qualitatively reliable, the results should be considered estimated values. Trifluralin is one of those pesticides.

Organophosphate pesticides (Table 8) were detected in 40 samples (36%) and were the second most commonly detected class of pesticides. Chlorpyrifos was the most commonly detected OP (25%) with a maximum concentration of 2.2 µg/L at Island Field Drain on Catrina Road (SSJ04). Dimethoate was detected at 14% of the sites with the highest concentration of 1.2 µg/L found at Bear Creek at Alpine Road (NSJ32).

Carbamates (Table 9) were detected in 10 samples (9%). Only carbaryl and methomyl were detected. A maximum concentration of carbaryl (3.6 µg/L) was found at Drain to Walker Creek at Country Road F (CS24); carbaryl was only detected in central Sacramento and north San Joaquin sites. Methomyl was detected mainly in the south San Joaquin basin with the highest

concentration of 1 µg/L at Island Field Drain on Catrina Road (SSJ04).

The acaricide propargite (Table 10) was found in nine samples (8%) with the maximum concentration of 2 µg/L detected at Island Field Drain on Catrina Road (SSJ04). Apart from the sixteen herbicides mentioned previously, propargite was also analyzed only at a screening level. As with the screened herbicides, the analyses for propargite are qualitatively reliable, but according to the Department of Fish and Game's reports, quantification of the values should be considered estimations.

Pyrethroids (Table 11) were detected in three samples (3%). Three different pyrethroids were detected at the three sites. Cyhalothin, lambda-2 was detected at Spring Creek at Walnut Drive CS15), bifenthrin was found at Elk Bayou above Tule River channel at Road 96 (FT24), and esfenvalerate was detected at Melga Canal near Tulare lake bottom (FT25). Deltamethrin is also a pesticide that, for methodological purposes, is only screened. As with other screened pesticides, while results are qualitatively reliable, they are considered estimates.

Organochlorine pesticides (Table 12) were found only one time (1%). DDD(o,p') was detected in the N-S Ditch along Natomas Road (SS09) with a concentration of 0.005 µg/L. The fungicide captan was not detected at all.

WATER COLUMN TOXICITY

One hundred and seven water column samples were collected and tested for acute and chronic toxicity (Table 15). Acute tests were run with *Ceriodaphnia dubia*, *Pimephales promelas*, and *Selenastrum capricornutum* in 96-hour survival tests. In tests run with *Ceriodaphnia dubia*, thirteen (12%) samples showed significantly different survival rates compared to control samples. Four samples (4%) showed significantly different survival from control samples in tests with *Pimephales promelas*. One sample, Tributary of Home Colony Canal at Hwy 99 (CS01), showed significantly different growth compared to *Selenastrum capricornutum* control samples.

INORGANIC RESULTS

During the 2005 Irrigation Season, 108 surface water samples were collected and analyzed for nutrients (ammonia, nitrate+nitrite, nitrite, orthophosphate, phosphorus) (Table 16), physical parameters (color, total dissolved solids, turbidity), hardness, and total organic carbon (Table 17).

Nutrients

Ammonia was detected at 63% of the sites with the highest concentration (1.81 mg/L) at N-S Ditch along Natomas Road (SS09). Nitrate+Nitrite was found at 83% of the sites while nitrite was only detected at 39% of the sites. Island Field Drain on Catrina Road (SSJ04) had the highest concentrations of both nitrate+nitrite (7.46 mg/L) and nitrite (0.223 mg/L).

Orthophosphate was found at all of the sites while phosphorus was detected in 98% of the sites. The highest concentration for both orthophosphate and phosphorus were found at Paddy Creek at Jack Tone Road – NSJ38 (1.76 mg/L and 2065 µg/L, respectively).

Physical Parameters, Total organic carbon (TOC), and Hardness

Color was found in 95% of the samples. The maximum value for color (170 color units) was detected at Paddy Creek at Jack Tone Road (NSJ38). Total dissolved solids (TDS) were detected at all of the sites. The highest value for TDS (688 mg/L) was found at Boundary Drain at Henry Miller Avenue (SSJ07). Like TDS, turbidity was also found at all sites. The most turbid water was at Spring Creek at East Camp Road (CS23) with 390 NTU. The maximum amount of total organic carbon (23.09 mg/L) was found at Paddy Creek at Jack Tone Road (NJS38), while the hardest water (238 mg/L of $CaCO_3$) was at Boundary Drain at Henry Miller Avenue (SSJ07).

METALS

One hundred and eight surface water samples were analyzed for eight metals (arsenic, boron, cadmium, copper, lead, nickel, selenium, and zinc) (Table 18). Arsenic, copper, lead, and nickel were found in all of the sites. Boron was detected at 99% of the sites, cadmium in 52%, selenium in 87%, and zinc in 97% of the sites. Spring Creek at East Camp Road (CS23) had the highest concentrations of cadmium (0.32 µg/L), copper (115 µg/L), lead, (22.2 µg/L), nickel (173 µg/L) and zinc (183 µg/L). Boundary Drain at Henry Miller Avenue (SSJ07) showed the highest concentration of boron (0.538 µg/L) and selenium (5.63 µg/L). Arsenic was highest at N-S Ditch along Natomas Road (SS09) with 7.27 µg/L.

FIELD MEASURES

Field measures (Table 19), including water temperature, pH, dissolved oxygen, and specific conductivity, were taken at one hundred and eleven water sampling events. Water temperatures ranged from 13.7°C (at FT31) to 32.4°C (at CS11). Values for pH were between 5.78 (at NSJ34) and 9.45 (at FT19). Dissolved oxygen values ranged from 0.6 (at NSJ34) and 16.2 (and NSJ36). Specific conductivity values were found between 24.5 (at FT31) and 1049 (at SSJ07).

SEDIMENT

Sediments were collected at 34 sites between August 1 and August 20, 2005. Each site was sampled once, following the protocol described in the Quality Assurance Project Plan. Briefly, the upper 1 cm of the sediment column was collected using a stainless steel scoop. Multiple scoops were taken until a total of 4 liters of sediment was collected. The sediment was thoroughly homogenized in the laboratory, and sub-samples taken for chemical analysis and toxicity testing. The majority of sites were located at the same point as where the water samples were taken. Thirteen sites were chosen by UC Berkeley and only sampled for sediment. Results are included in Appendix II.

Table 7. Summary of herbicides detected during Irrigation season 2005 (µg/L). No values indicate results are below RL and MDL

Site ID	Date	Time	Alachlor*	Ametryn*	Atraton*	Atrazine	Cyanazine	Diuron	Linuron	Metolachlor*	Molinate	Norflurazon*	Oxyfluorfen*	Prometon*	Prometryn*	Propanil*	Propazine*	Prowl*	Secbumeton*	Simazine	Simetryn*	Terbuthylazine*	Terbutryn*	Thiobencarb	Trifluralin*
CS01	**6/13/2005**	**8:30**																							
CS01	6/27/2005	9:20																							
CS01	7/11/2005	9:30																							
CS01	7/25/2005	8:00											0.068				0.026	0.034							
CS06	**6/14/2005**	**8:50**																							
CS06	6/27/2005	10:40																							
CS06	7/11/2005	11:00																							
CS06	7/25/2005	11:50																							
CS11	**6/14/2005**	**11:30**																							
CS11	6/27/2005	13:00																							
CS11	7/11/2005	13:00																							
CS11	7/25/2005	14:20															0.115								
CS12	**6/13/2005**	**10:10**																							
CS12	6/27/2005	7:50																							
CS12	7/11/2005	7:50																							
CS12	7/25/2005	10:00								0.012							0.013								
CS15	**6/13/2005**	**13:30**								0.461			0.082												0.449
CS15	6/28/2005	8:00								1.060															0.095
CS15	7/12/2005	7:30								0.217															0.131
CS15	7/26/2005	7:20								0.017															0.552
CS23	**6/13/2005**	**12:20**								3.370		0.233				0.116									0.042
CS23	6/28/2005	7:20								0.366															
CS23	7/12/2005	8:30								0.299															
CS24	**7/11/2005**	**8:40**																							
CS24	7/25/2005	9:10																							
FT05	**6/20/2005**	**15:10**																							
FT05	7/5/2005	12:40																							
FT05	7/18/2005	13:10																							
FT05	8/1/2005	14:30																							
FT18	**6/20/2005**	**11:50**																							
FT18	7/5/2005	10:20																							
FT18	7/19/2005	10:00																							
FT18	8/2/2005	8:40																							
FT19	**6/20/2005**	**14:00**						0.508				0.256								0.400				1.500	
FT19	7/5/2005	12:00						0.692												2.500					
FT19	7/19/2005	9:10																							
FT19	8/2/2005	7:50																		0.070					
FT23	**6/21/2005**	**7:30**																							
FT23	7/6/2005	8:30																							
FT23	7/18/2005	14:50																							
FT23	8/1/2005	15:40																							
FT24	**6/21/2005**	**9:20**																							
FT24	7/6/2005	7:40																							
FT24	7/18/2005	9:30																							
FT24	8/1/2005	8:40																							
FT25	**6/20/2005**	**7:40**																							
FT25	7/5/2005	7:40																							
FT25	7/18/2005	10:50																							
FT25	8/1/2005	10:00																							
FT31	**6/20/2005**	**8:50**																							
FT31	7/5/2005	8:30																							
FT31	7/18/2005	11:50																							
FT31	8/1/2005	13:00																							
NSJ04	**6/15/2005**	**9:30**						0.030																	
NSJ04	6/29/2005	12:50																							
NSJ04	7/13/2005	11:00																		0.122					
NSJ04	7/27/2005	10:40								0.032		0.100	0.079		0.039		0.032								
NSJ28	**6/16/2005**	**9:10**																							
NSJ28	6/30/2005	7:50																							
NSJ28	7/14/2005	9:20																							
NSJ28	7/28/2005	9:20								0.139		0.166	0.154				0.033								0.021

Table 7. (Con'td) Summary of herbicides detected during Irrigation season 2005 (µg/L). No values indicate results are below RL and MDL

Site ID	Date	Time	Alachlor*	Ametryn*	Atraton*	Atrazine	Cyanazine	Diuron	Linuron	Metolachlor*	Molinate	Norflurazon*	Oxyfluren*	Prometon*	Prometryn*	Propanil*	Propazine*	Prowl*	Secbumeton*	Simazine	Simetryn*	Terbuthylazine*	Terbutryn*	Thiobencarb	Trifluralin*
NSJ31	**6/15/2005**	**10:40**																							
NSJ31	6/29/2005	10:50																							
NSJ31	7/13/2005	9:40																		0.120					
NSJ31	7/27/2005	9:30																							
NSJ32	**6/15/2005**	**13:00**																							
NSJ32	6/29/2005	10:10								1.220															0.075
NSJ32	7/13/2005	9:20																							
NSJ32	7/27/2005	9:00																							
NSJ34	**6/15/2005**	**8:40**																							
NSJ34	6/29/2005	9:00																							
NSJ34	7/13/2005	8:30																							
NSJ34	7/27/2005	8:10															0.052								0.010
NSJ36	**6/16/2005**	**10:20**																							
NSJ36	6/30/2005	9:30																							
NSJ36	7/14/2005	10:20																							
NSJ36	7/28/2005	10:10										0.183													
NSJ38	**6/15/2005**	**7:30**																							
NSJ38	6/29/2005	8:10																							
NSJ38	7/13/2005	7:50														0.162									
NSJ38	7/27/2005	7:40																							
SJC516	**6/16/2005**	**7:30**																							
SJC516	6/30/2005	12:00																							
SJC516	7/14/2005	7:30								0.607															0.026
SJC516	7/28/2005	7:40																							
SJC517	**7/14/2005**	**8:20**								1.105										0.024					0.090
SJC517	7/28/2005	8:30																							
SS05	**6/14/2005**	**13:20**				0.035					0.059					1.170								150.000	
SS05	6/28/2005	10:10									0.048														
SS05	7/12/2005	10:40									0.060														
SS05	7/26/2005	9:00								0.020							0.020								
SS09	**6/14/2005**	**14:40**				0.072				0.032	0.760					0.721								2.200	
SS09	6/28/2005	11:30									0.440													1.160	
SS09	7/12/2005	11:30									0.070		0.447			23.170								0.900	
SS09	7/26/2005	9:40									0.063														
SSJ03	**6/22/2005**	**11:10**																							
SSJ03	7/7/2005	11:40																							
SSJ03	7/20/2005	10:40								0.019		0.104	0.057				0.021								
SSJ03	8/3/2005	12:50																							
SSJ04	**6/22/2005**	**9:50**						0.156		0.264															0.087
SSJ04	7/7/2005	10:20								0.626															0.449
SSJ04	7/20/2005	9:20								0.138			0.142					0.325							0.167
SSJ04	8/3/2005	9:40						0.061		1.090															0.643
SSJ07	**6/22/2005**	**8:40**						0.216																	
SSJ07	7/7/2005	9:10						0.218		0.623															0.456
SSJ07	7/20/2005	8:20						0.079		0.127															0.201
SSJ07	8/3/2005	8:40						0.080		0.030															0.056
SSJ10	**6/22/2005**	**13:00**								0.192						0.118								0.300	0.016
SSJ10	7/7/2005	13:10								1.100	0.040					0.622									0.078
SSJ10	7/20/2005	12:20				0.080		0.031		0.193		0.095					0.018								0.086
SSJ10	8/3/2005	11:10						0.080		0.033	0.042		0.022												
Maximum value			0	0	0	0.08	0	0.692	0	3.37	0.76	0.256	0.447	0	0.039	23.17	0.115	0.325	0	2.5	0	0	0	150	0.643
Median			NA	NA	NA	0.072	NA	0.08	NA	0.217	0.06	0.166	0.080	NA	0.039	0.622	0.026	0.179	NA	0.121	NA	NA	NA	1.33	0.089
90th percentile			NA	NA	NA	0.078	NA	0.508	NA	1.102	0.504	0.242	0.242	NA	0.039	9.97	0.065	0.296	NA	1.45	NA	NA	NA	76.1	0.466
Number of samples			111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111
Frequency (%)			0	0	0	2.7	0	9.9	0	24.3	8.1	6.3	7.2	0	0.9	6.3	8.1	1.8	0	5.4	0	0	0	5.4	18.0

*** Pesticides analyzed by DFG-WPCL at screening level only**

Table 8. Summary of organophosphate pesticides detected during Irrigation season 2005 (µg/L). No values indicate results are below RL and MDL

Site ID	Date	Time	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Ethyl	Parathion, Methyl	Phorate	Phosmet
CS01	**6/13/2005**	**8:30**											
CS01	6/27/2005	9:20											
CS01	7/11/2005	9:30											
CS01	7/25/2005	8:00			0.034								
CS06	**6/14/2005**	**8:50**											
CS06	6/27/2005	10:40											
CS06	7/11/2005	11:00											
CS06	7/25/2005	11:50											
CS11	**6/14/2005**	**11:30**											
CS11	6/27/2005	13:00											
CS11	7/11/2005	13:00		0.028									
CS11	7/25/2005	14:20		0.018									
CS12	**6/13/2005**	**10:10**		0.083									
CS12	6/27/2005	7:50		0.025									
CS12	7/11/2005	7:50		0.022									
CS12	7/25/2005	10:00		0.042									
CS15	**6/13/2005**	**13:30**			0.015								
CS15	6/28/2005	8:00											
CS15	7/12/2005	7:30											
CS15	7/26/2005	7:20											
CS23	**6/13/2005**	**12:20**			2.000								
CS23	6/28/2005	7:20											
CS23	7/12/2005	8:30											
CS24	**7/11/2005**	**8:40**											
CS24	7/25/2005	9:10		0.043	0.025								
FT05	**6/20/2005**	**15:10**											
FT05	7/5/2005	12:40											
FT05	7/18/2005	13:10		0.038									
FT05	8/1/2005	14:30		0.026									
FT18	**6/20/2005**	**11:50**											
FT18	7/5/2005	10:20											
FT18	7/19/2005	10:00											
FT18	8/2/2005	8:40											
FT19	**6/20/2005**	**14:00**											
FT19	7/5/2005	12:00		0.035		1.060							
FT19	7/19/2005	9:10		0.079							0.044		
FT19	8/2/2005	7:50		0.280			0.013	0.032					
FT23	**6/21/2005**	**7:30**											
FT23	7/6/2005	8:30											
FT23	7/18/2005	14:50											
FT23	8/1/2005	15:40											
FT24	**6/21/2005**	**9:20**		0.021									
FT24	7/6/2005	7:40		0.112		0.774							
FT24	7/18/2005	9:30		0.039		0.800							
FT24	8/1/2005	8:40		0.270		0.046							
FT25	**6/20/2005**	**7:40**											
FT25	7/5/2005	7:40											
FT25	7/18/2005	10:50											
FT25	8/1/2005	10:00											
FT31	**6/20/2005**	**8:50**											
FT31	7/5/2005	8:30											
FT31	7/18/2005	11:50											
FT31	8/1/2005	13:00											
NSJ04	**6/15/2005**	**9:30**											
NSJ04	6/29/2005	12:50											
NSJ04	7/13/2005	11:00											
NSJ04	7/27/2005	10:40											
NSJ28	**6/16/2005**	**9:10**											
NSJ28	6/30/2005	7:50											
NSJ28	7/14/2005	9:20											
NSJ28	7/28/2005	9:20											

Table 8. (Cont'd) Summary of organophosphate pesticides detected during Irrigation season 2005 (µg/L).
No values indicate results are below RL and MDL

Site ID	Date	Time	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Ethyl	Parathion, Methyl	Phorate	Phosmet
NSJ31	**6/15/2005**	**10:40**											
NSJ31	6/29/2005	10:50											
NSJ31	7/13/2005	9:40	0.330								0.188		
NSJ31	7/27/2005	9:30									0.016		
NSJ32	**6/15/2005**	**13:00**											
NSJ32	6/29/2005	10:10											
NSJ32	7/13/2005	9:20				1.200							
NSJ32	7/27/2005	9:00	0.165	0.214		0.059					0.016		
NSJ34	**6/15/2005**	**8:40**											
NSJ34	6/29/2005	9:00											
NSJ34	7/13/2005	8:30											
NSJ34	7/27/2005	8:10											
NSJ36	**6/16/2005**	**10:20**		0.034		0.180							
NSJ36	6/30/2005	9:30											
NSJ36	7/14/2005	10:20											
NSJ36	7/28/2005	10:10											
NSJ38	**6/15/2005**	**7:30**											
NSJ38	6/29/2005	8:10											
NSJ38	7/13/2005	7:50											
NSJ38	7/27/2005	7:40											
SJC516	**6/16/2005**	**7:30**											
SJC516	6/30/2005	12:00											
SJC516	7/14/2005	7:30											
SJC516	7/28/2005	7:40				0.054							
SJC517	**7/14/2005**	**8:20**				0.095							
SJC517	7/28/2005	8:30				1.040							
SS05	**6/14/2005**	**13:20**						46.000			0.078		
SS05	6/28/2005	10:10											
SS05	7/12/2005	10:40											
SS05	7/26/2005	9:00											
SS09	**6/14/2005**	**14:40**		0.018									
SS09	6/28/2005	11:30											
SS09	7/12/2005	11:30											
SS09	7/26/2005	9:40											
SSJ03	**6/22/2005**	**11:10**											
SSJ03	7/7/2005	11:40		0.256									
SSJ03	7/20/2005	10:40		0.023									
SSJ03	8/3/2005	12:50											
SSJ04	**6/22/2005**	**9:50**		0.037									
SSJ04	7/7/2005	10:20		2.200		0.031		0.125					
SSJ04	7/20/2005	9:20		0.045		0.045							
SSJ04	8/3/2005	9:40		0.098		0.044							
SSJ07	**6/22/2005**	**8:40**		0.022									
SSJ07	7/7/2005	9:10		0.105									
SSJ07	7/20/2005	8:20		0.025									
SSJ07	8/3/2005	8:40											
SSJ10	**6/22/2005**	**13:00**											
SSJ10	7/7/2005	13:10				0.063							
SSJ10	7/20/2005	12:20				0.040	0.017						
SSJ10	8/3/2005	11:10											
Maximum value			0.33	2.2	2	1.2	0.017	46	0	0	0.188	0	0
Median			0.248	0.039	0.030	0.063	0.015	0.125	NA	NA	0.044	NA	NA
90th percentile			0.314	0.260	1.410	1.052	0.017	36.825	NA	NA	0.144	NA	NA
Number of samples			111	111	111	111	111	111	111	111	111	111	111
Frequency (%)			1.8	25.2	3.6	13.5	1.8	2.7	0	0.0	4.5	0	0

Table 9. Summary of carbamates detected during Irrigation season 2005 (µg/L).
No values indicate results are below RL and MDL

Site ID	Date	Time	Aldicarb	Carbaryl	Carbofuran	Methiocarb	Methomyl
CS01	**6/13/2005**	**8:30**					
CS01	6/27/2005	9:20					
CS01	7/11/2005	9:30					
CS01	7/25/2005	8:00					
CS06	**6/14/2005**	**8:50**					
CS06	6/27/2005	10:40					
CS06	7/11/2005	11:00					
CS06	7/25/2005	11:50					
CS11	**6/14/2005**	**11:30**					
CS11	6/27/2005	13:00					
CS11	7/11/2005	13:00					
CS11	7/25/2005	14:20					
CS12	**6/13/2005**	**10:10**		0.3			
CS12	6/27/2005	7:50					
CS12	7/11/2005	7:50					
CS12	7/25/2005	10:00		0.33			
CS15	**6/13/2005**	**13:30**					
CS15	6/28/2005	8:00					
CS15	7/12/2005	7:30					
CS15	7/26/2005	7:20					
CS23	**6/13/2005**	**12:20**					
CS23	6/28/2005	7:20					
CS23	7/12/2005	8:30					
CS24	**7/11/2005**	**8:40**					
CS24	7/25/2005	9:10		3.6			
FT05	**6/20/2005**	**15:10**					
FT05	7/5/2005	12:40					
FT05	7/18/2005	13:10					
FT05	8/1/2005	14:30					
FT18	**6/20/2005**	**11:50**					
FT18	7/5/2005	10:20					
FT18	7/19/2005	10:00					
FT18	8/2/2005	8:40					0.36
FT19	**6/20/2005**	**14:00**					
FT19	7/5/2005	12:00					
FT19	7/19/2005	9:10					
FT19	8/2/2005	7:50					
FT23	**6/21/2005**	**7:30**					
FT23	7/6/2005	8:30					
FT23	7/18/2005	14:50					
FT23	8/1/2005	15:40					
FT24	**6/21/2005**	**9:20**					
FT24	7/6/2005	7:40					
FT24	7/18/2005	9:30					
FT24	8/1/2005	8:40					
FT25	**6/20/2005**	**7:40**					
FT25	7/5/2005	7:40					
FT25	7/18/2005	10:50					
FT25	8/1/2005	10:00					
FT31	**6/20/2005**	**8:50**					
FT31	7/5/2005	8:30					
FT31	7/18/2005	11:50					
FT31	8/1/2005	13:00					
NSJ04	**6/15/2005**	**9:30**					
NSJ04	6/29/2005	12:50					
NSJ04	7/13/2005	11:00					
NSJ04	7/27/2005	10:40					

Table 9. (Cont'd) Summary of carbamates detected during Irrigation season 2005 (µg/L).
No values indicate results are below RL and MDL

Site ID	Date	Time	Aldicarb	Carbaryl	Carbofuran	Methiocarb	Methomyl
NSJ28	**6/16/2005**	**9:10**		0.16			
NSJ28	6/30/2005	7:50					
NSJ28	7/14/2005	9:20					
NSJ28	7/28/2005	9:20					
NSJ31	**6/15/2005**	**10:40**					
NSJ31	6/29/2005	10:50					
NSJ31	7/13/2005	9:40					
NSJ31	7/27/2005	9:30					
NSJ32	**6/15/2005**	**13:00**					
NSJ32	6/29/2005	10:10					
NSJ32	7/13/2005	9:20					
NSJ32	7/27/2005	9:00					
NSJ34	**6/15/2005**	**8:40**					
NSJ34	6/29/2005	9:00					
NSJ34	7/13/2005	8:30					
NSJ34	7/27/2005	8:10					
NSJ36	**6/16/2005**	**10:20**					
NSJ36	6/30/2005	9:30					
NSJ36	7/14/2005	10:20					
NSJ36	7/28/2005	10:10					
NSJ38	**6/15/2005**	**7:30**					
NSJ38	6/29/2005	8:10					
NSJ38	7/13/2005	7:50					
NSJ38	7/27/2005	7:40					
SJC516	**6/16/2005**	**7:30**					
SJC516	6/30/2005	12:00					
SJC516	7/14/2005	7:30					
SJC516	7/28/2005	7:40					
SJC517	**7/14/2005**	**8:20**					
SJC517	7/28/2005	8:30					
SS05	**6/14/2005**	**13:20**					
SS05	6/28/2005	10:10					
SS05	7/12/2005	10:40					
SS05	7/26/2005	9:00					
SS09	**6/14/2005**	**14:40**					
SS09	6/28/2005	11:30					
SS09	7/12/2005	11:30					
SS09	7/26/2005	9:40					
SSJ03	**6/22/2005**	**11:10**					
SSJ03	7/7/2005	11:40					
SSJ03	7/20/2005	10:40					
SSJ03	8/3/2005	12:50					
SSJ04	**6/22/2005**	**9:50**					
SSJ04	7/7/2005	10:20					
SSJ04	7/20/2005	9:20					0.64
SSJ04	8/3/2005	9:40					1
SSJ07	**6/22/2005**	**8:40**					
SSJ07	7/7/2005	9:10					
SSJ07	7/20/2005	8:20					0.38
SSJ07	8/3/2005	8:40					0.054
SSJ10	**6/22/2005**	**13:00**					
SSJ10	7/7/2005	13:10					
SSJ10	7/20/2005	12:20					
SSJ10	8/3/2005	11:10					0.216
Maximum value			0	3.6	0	0	1
Median			NA	0.315	NA	NA	0.37
90th percentile			NA	2.619	NA	NA	0.82
Number of samples			111	111	111	111	111
Frequency (%)			0	3.6	0	0	5.4

Table 10. Summary of acaricides detected during Irrigation season 2005 (µg/L).
No values indicate results are below RL and MDL

Site ID	Date	Time	Propargite*
CS01	**6/13/2005**	**8:30**	
CS01	6/27/2005	9:20	
CS01	7/11/2005	9:30	
CS01	7/25/2005	8:00	
CS06	**6/14/2005**	**8:50**	
CS06	6/27/2005	10:40	
CS06	7/11/2005	11:00	
CS06	7/25/2005	11:50	
CS11	**6/14/2005**	**11:30**	
CS11	6/27/2005	13:00	
CS11	7/11/2005	13:00	
CS11	7/25/2005	14:20	
CS12	**6/13/2005**	**10:10**	
CS12	6/27/2005	7:50	
CS12	7/11/2005	7:50	0.26
CS12	7/25/2005	10:00	
CS15	**6/13/2005**	**13:30**	
CS15	6/28/2005	8:00	
CS15	7/12/2005	7:30	
CS15	7/26/2005	7:20	
CS23	**6/13/2005**	**12:20**	
CS23	6/28/2005	7:20	
CS23	7/12/2005	8:30	
CS24	**7/11/2005**	**8:40**	
CS24	7/25/2005	9:10	
FT05	**6/20/2005**	**15:10**	
FT05	7/5/2005	12:40	1.80
FT05	7/18/2005	13:10	
FT05	8/1/2005	14:30	
FT18	**6/20/2005**	**11:50**	
FT18	7/5/2005	10:20	
FT18	7/19/2005	10:00	
FT18	8/2/2005	8:40	
FT19	**6/20/2005**	**14:00**	
FT19	7/5/2005	12:00	
FT19	7/19/2005	9:10	
FT19	8/2/2005	7:50	
FT23	**6/21/2005**	**7:30**	
FT23	7/6/2005	8:30	
FT23	7/18/2005	14:50	
FT23	8/1/2005	15:40	
FT24	**6/21/2005**	**9:20**	
FT24	7/6/2005	7:40	0.15
FT24	7/18/2005	9:30	
FT24	8/1/2005	8:40	
FT25	**6/20/2005**	**7:40**	
FT25	7/5/2005	7:40	
FT25	7/18/2005	10:50	
FT25	8/1/2005	10:00	
FT31	**6/20/2005**	**8:50**	
FT31	7/5/2005	8:30	
FT31	7/18/2005	11:50	
FT31	8/1/2005	13:00	
NSJ04	**6/15/2005**	**9:30**	
NSJ04	6/29/2005	12:50	
NSJ04	7/13/2005	11:00	
NSJ04	7/27/2005	10:40	

Site ID	Date	Time	Propargite*
NSJ28	**6/16/2005**	**9:10**	
NSJ28	6/30/2005	7:50	
NSJ28	7/14/2005	9:20	
NSJ28	7/28/2005	9:20	
NSJ31	**6/15/2005**	**10:40**	
NSJ31	6/29/2005	10:50	
NSJ31	7/13/2005	9:40	2.00
NSJ31	7/27/2005	9:30	
NSJ32	**6/15/2005**	**13:00**	
NSJ32	6/29/2005	10:10	
NSJ32	7/13/2005	9:20	
NSJ32	7/27/2005	9:00	
NSJ34	**6/15/2005**	**8:40**	
NSJ34	6/29/2005	9:00	
NSJ34	7/13/2005	8:30	0.02
NSJ34	7/27/2005	8:10	
NSJ36	**6/16/2005**	**10:20**	
NSJ36	6/30/2005	9:30	
NSJ36	7/14/2005	10:20	
NSJ36	7/28/2005	10:10	
NSJ38	**6/15/2005**	**7:30**	
NSJ38	6/29/2005	8:10	
NSJ38	7/13/2005	7:50	0.05
NSJ38	7/27/2005	7:40	
SJC516	**6/16/2005**	**7:30**	
SJC516	6/30/2005	12:00	
SJC516	7/14/2005	7:30	
SJC516	7/28/2005	7:40	
SJC517	**7/14/2005**	**8:20**	
SJC517	7/28/2005	8:30	
SS05	**6/14/2005**	**13:20**	
SS05	6/28/2005	10:10	
SS05	7/12/2005	10:40	
SS05	7/26/2005	9:00	
SS09	**6/14/2005**	**14:40**	
SS09	6/28/2005	11:30	
SS09	7/12/2005	11:30	
SS09	7/26/2005	9:40	
SSJ03	**6/22/2005**	**11:10**	
SSJ03	7/7/2005	11:40	
SSJ03	7/20/2005	10:40	
SSJ03	8/3/2005	12:50	
SSJ04	**6/22/2005**	**9:50**	2.00
SSJ04	7/7/2005	10:20	0.25
SSJ04	7/20/2005	9:20	
SSJ04	8/3/2005	9:40	
SSJ07	**6/22/2005**	**8:40**	
SSJ07	7/7/2005	9:10	0.15
SSJ07	7/20/2005	8:20	
SSJ07	8/3/2005	8:40	
SSJ10	**6/22/2005**	**13:00**	
SSJ10	7/7/2005	13:10	
SSJ10	7/20/2005	12:20	
SSJ10	8/3/2005	11:10	

Maximum value	2.00
Median	0.25
90th percentile	2.00
Number of samples	111
Frequency (%)	8.1

*** Pesticides analyzed by DFG-WPCL at screening level only**

Table 11. Summary of pyrethroids detected during Irrigation season 2005 (µg/L). No values indicate results are below RL and MDL

Site ID	Date	Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cyhalothrin, lambda-1	Cyhalothrin, lambda-2	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	Deltamethrin*	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2
CS01	6/13/2005	8:30																
CS01	6/27/2005	9:20																
CS01	7/11/2005	9:30																
CS01	7/25/2005	8:00																
CS06	6/14/2005	8:50																
CS06	6/27/2005	10:40																
CS06	7/11/2005	11:00																
CS06	7/25/2005	11:50																
CS11	6/14/2005	11:30																
CS11	6/27/2005	13:00																
CS11	7/11/2005	13:00																
CS11	7/25/2005	14:20																
CS12	6/13/2005	10:10																
CS12	6/27/2005	7:50																
CS12	7/11/2005	7:50																
CS12	7/25/2005	10:00																
CS15	6/13/2005	13:30							0.014									
CS15	6/28/2005	8:00																
CS15	7/12/2005	7:30																
CS15	7/26/2005	7:20																
CS23	6/13/2005	12:20																
CS23	6/28/2005	7:20																
CS23	7/12/2005	8:30																
CS24	7/11/2005	8:40																
CS24	7/25/2005	9:10																
FT05	6/20/2005	15:10																
FT05	7/5/2005	12:40																
FT05	7/18/2005	13:10																
FT05	8/1/2005	14:30																
FT18	6/20/2005	11:50																
FT18	7/5/2005	10:20																
FT18	7/19/2005	10:00																
FT18	8/2/2005	8:40																
FT19	6/20/2005	14:00																
FT19	7/5/2005	12:00																
FT19	7/19/2005	9:10																
FT19	8/2/2005	7:50																
FT23	6/21/2005	7:30																
FT23	7/6/2005	8:30																
FT23	7/18/2005	14:50																
FT23	8/1/2005	15:40																
FT24	6/21/2005	9:20																
FT24	7/6/2005	7:40	0.037															
FT24	7/18/2005	9:30																
FT24	8/1/2005	8:40																
FT25	6/20/2005	7:40																
FT25	7/5/2005	7:40																
FT25	7/18/2005	10:50													0.009			
FT25	8/1/2005	10:00																
FT31	6/20/2005	8:50																
FT31	7/5/2005	8:30																
FT31	7/18/2005	11:50																
FT31	8/1/2005	13:00																
NSJ04	6/15/2005	9:30																
NSJ04	6/29/2005	12:50																
NSJ04	7/13/2005	11:00																
NSJ04	7/27/2005	10:40																

Table 11. (Cont'd) Summary of pyrethroids detected during Irrigation season 2005 (µg/L). No values indicate results are below RL and MDL

Site ID	Date	Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cyhalothrin, lambda-1	Cyhalothrin, lambda-2	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	Deltamethrin*	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2
NSJ28	6/16/2005	9:10																
NSJ28	6/30/2005	7:50																
NSJ28	7/14/2005	9:20																
NSJ28	7/28/2005	9:20																
NSJ31	6/15/2005	10:40																
NSJ31	6/29/2005	10:50																
NSJ31	7/13/2005	9:40																
NSJ31	7/27/2005	9:30																
NSJ32	6/15/2005	13:00																
NSJ32	6/29/2005	10:10																
NSJ32	7/13/2005	9:20																
NSJ32	7/27/2005	9:00																
NSJ34	6/15/2005	8:40																
NSJ34	6/29/2005	9:00																
NSJ34	7/13/2005	8:30																
NSJ34	7/27/2005	8:10																
NSJ36	6/16/2005	10:20																
NSJ36	6/30/2005	9:30																
NSJ36	7/14/2005	10:20																
NSJ36	7/28/2005	10:10																
NSJ38	6/15/2005	7:30																
NSJ38	6/29/2005	8:10																
NSJ38	7/13/2005	7:50																
NSJ38	7/27/2005	7:40																
SJC516	6/16/2005	7:30																
SJC516	6/30/2005	12:00																
SJC516	7/14/2005	7:30																
SJC516	7/28/2005	7:40																
SJC517	7/14/2005	8:20																
SJC517	7/28/2005	8:30																
SS05	6/14/2005	13:20																
SS05	6/28/2005	10:10																
SS05	7/12/2005	10:40																
SS05	7/26/2005	9:00																
SS09	6/14/2005	14:40																
SS09	6/28/2005	11:30																
SS09	7/12/2005	11:30																
SS09	7/26/2005	9:40																
SSJ03	6/22/2005	11:10																
SSJ03	7/7/2005	11:40																
SSJ03	7/20/2005	10:40																
SSJ03	8/3/2005	12:50																
SSJ04	6/22/2005	9:50																
SSJ04	7/7/2005	10:20																
SSJ04	7/20/2005	9:20																
SSJ04	8/3/2005	9:40																
SSJ07	6/22/2005	8:40																
SSJ07	7/7/2005	9:10																
SSJ07	7/20/2005	8:20																
SSJ07	8/3/2005	8:40																
SSJ10	6/22/2005	13:00																
SSJ10	7/7/2005	13:10																
SSJ10	7/20/2005	12:20																
SSJ10	8/3/2005	11:10																
Maximum value			0.037	0	0	0	0	0	0.014	0	0	0	0	0	0.009	0	0	0
Median			0.037	NA	NA	NA	NA	NA	0.014	NA	NA	NA	NA	NA	0.009	NA	NA	NA
90th percentile			0.037	NA	NA	NA	NA	NA	0.014	NA	NA	NA	NA	NA	0.009	NA	NA	NA
Number of samples			111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111
Frequency (%)			0.9	0	0	0	0	0	0.9	0	0	0	0	0	0.9	0	0	0

*** Pesticides analyzed by DFG-WPCL at screening level only**

Table 12. Summary of organochlorine pesticides detected during Irrigation season 2005 (µg/L). No values indicate results are below RL and MDL

Site ID	Date	Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor
CS01	**6/13/2005**	**8:30**										
CS01	6/27/2005	9:20										
CS01	7/11/2005	9:30										
CS01	7/25/2005	8:00										
CS06	**6/14/2005**	**8:50**										
CS06	6/27/2005	10:40										
CS06	7/11/2005	11:00										
CS06	7/25/2005	11:50										
CS11	**6/14/2005**	**11:30**										
CS11	6/27/2005	13:00										
CS11	7/11/2005	13:00										
CS11	7/25/2005	14:20										
CS12	**6/13/2005**	**10:10**										
CS12	6/27/2005	7:50										
CS12	7/11/2005	7:50										
CS12	7/25/2005	10:00										
CS15	**6/13/2005**	**13:30**										
CS15	6/28/2005	8:00										
CS15	7/12/2005	7:30										
CS15	7/26/2005	7:20										
CS23	**6/13/2005**	**12:20**										
CS23	6/28/2005	7:20										
CS23	7/12/2005	8:30										
CS24	**7/11/2005**	**8:40**										
CS24	7/25/2005	9:10										
FT05	**6/20/2005**	**15:10**										
FT05	7/5/2005	12:40										
FT05	7/18/2005	13:10										
FT05	8/1/2005	14:30										
FT18	**6/20/2005**	**11:50**										
FT18	7/5/2005	10:20										
FT18	7/19/2005	10:00										
FT18	8/2/2005	8:40										
FT19	**6/20/2005**	**14:00**										
FT19	7/5/2005	12:00										
FT19	7/19/2005	9:10										
FT19	8/2/2005	7:50										
FT23	**6/21/2005**	**7:30**										
FT23	7/6/2005	8:30										
FT23	7/18/2005	14:50										
FT23	8/1/2005	15:40										
FT24	**6/21/2005**	**9:20**										
FT24	7/6/2005	7:40										
FT24	7/18/2005	9:30										
FT24	8/1/2005	8:40										
FT25	**6/20/2005**	**7:40**										
FT25	7/5/2005	7:40										
FT25	7/18/2005	10:50										
FT25	8/1/2005	10:00										
FT31	**6/20/2005**	**8:50**										
FT31	7/5/2005	8:30										
FT31	7/18/2005	11:50										
FT31	8/1/2005	13:00										
NSJ04	**6/15/2005**	**9:30**										
NSJ04	6/29/2005	12:50										
NSJ04	7/13/2005	11:00										
NSJ04	7/27/2005	10:40										

Table 12. (Cont'd) Summary of organochlorine pesticides detected during Irrigation season 2005 (µg/L). No values indicate results are below RL and MDL

Site ID	Date	Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor
NSJ28	**6/16/2005**	**9:10**										
NSJ28	6/30/2005	7:50										
NSJ28	7/14/2005	9:20										
NSJ28	7/28/2005	9:20										
NSJ31	**6/15/2005**	**10:40**										
NSJ31	6/29/2005	10:50										
NSJ31	7/13/2005	9:40										
NSJ31	7/27/2005	9:30										
NSJ32	**6/15/2005**	**13:00**										
NSJ32	6/29/2005	10:10										
NSJ32	7/13/2005	9:20										
NSJ32	7/27/2005	9:00										
NSJ34	**6/15/2005**	**8:40**										
NSJ34	6/29/2005	9:00										
NSJ34	7/13/2005	8:30										
NSJ34	7/27/2005	8:10										
NSJ36	**6/16/2005**	**10:20**										
NSJ36	6/30/2005	9:30										
NSJ36	7/14/2005	10:20										
NSJ36	7/28/2005	10:10										
NSJ38	**6/15/2005**	**7:30**										
NSJ38	6/29/2005	8:10										
NSJ38	7/13/2005	7:50										
NSJ38	7/27/2005	7:40										
SJC516	**6/16/2005**	**7:30**										
SJC516	6/30/2005	12:00										
SJC516	7/14/2005	7:30										
SJC516	7/28/2005	7:40										
SJC517	**7/14/2005**	**8:20**										
SJC517	7/28/2005	8:30										
SS05	**6/14/2005**	**13:20**										
SS05	6/28/2005	10:10										
SS05	7/12/2005	10:40										
SS05	7/26/2005	9:00										
SS09	**6/14/2005**	**14:40**	0.005									
SS09	6/28/2005	11:30										
SS09	7/12/2005	11:30										
SS09	7/26/2005	9:40										
SSJ03	**6/22/2005**	**11:10**										
SSJ03	7/7/2005	11:40										
SSJ03	7/20/2005	10:40										
SSJ03	8/3/2005	12:50										
SSJ04	**6/22/2005**	**9:50**										
SSJ04	7/7/2005	10:20										
SSJ04	7/20/2005	9:20										
SSJ04	8/3/2005	9:40										
SSJ07	**6/22/2005**	**8:40**										
SSJ07	7/7/2005	9:10										
SSJ07	7/20/2005	8:20										
SSJ07	8/3/2005	8:40										
SSJ10	**6/22/2005**	**13:00**										
SSJ10	7/7/2005	13:10										
SSJ10	7/20/2005	12:20										
SSJ10	8/3/2005	11:10										
Maximum value			0.005	0	0	0	0	0	0	0	0	0
Median			0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
90th percentile			0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA
Number of samples			111	111	111	111	111	111	111	111	111	111
Frequency (%)			0.9	0	0	0	0	0	0	0	0	0

Table 13. Summary of fungicides detected during Irrigation season 2005 (µg/L).
No values indicate results are below RL and MDL

Site ID	Date	Time	Captan
CS01	**6/13/2005**	**8:30**	
CS01	6/27/2005	9:20	
CS01	7/11/2005	9:30	
CS01	7/25/2005	8:00	
CS06	**6/14/2005**	**8:50**	
CS06	6/27/2005	10:40	
CS06	7/11/2005	11:00	
CS06	7/25/2005	11:50	
CS11	**6/14/2005**	**11:30**	
CS11	6/27/2005	13:00	
CS11	7/11/2005	13:00	
CS11	7/25/2005	14:20	
CS12	**6/13/2005**	**10:10**	
CS12	6/27/2005	7:50	
CS12	7/11/2005	7:50	
CS12	7/25/2005	10:00	
CS15	**6/13/2005**	**13:30**	
CS15	6/28/2005	8:00	
CS15	7/12/2005	7:30	
CS15	7/26/2005	7:20	
CS23	**6/13/2005**	**12:20**	
CS23	6/28/2005	7:20	
CS23	7/12/2005	8:30	
CS24	**7/11/2005**	**8:40**	
CS24	7/25/2005	9:10	
FT05	**6/20/2005**	**15:10**	
FT05	7/5/2005	12:40	
FT05	7/18/2005	13:10	
FT05	8/1/2005	14:30	
FT18	**6/20/2005**	**11:50**	
FT18	7/5/2005	10:20	
FT18	7/19/2005	10:00	
FT18	8/2/2005	8:40	
FT19	**6/20/2005**	**14:00**	
FT19	7/5/2005	12:00	
FT19	7/19/2005	9:10	
FT19	8/2/2005	7:50	
FT23	**6/21/2005**	**7:30**	
FT23	7/6/2005	8:30	
FT23	7/18/2005	14:50	
FT23	8/1/2005	15:40	
FT24	**6/21/2005**	**9:20**	
FT24	7/6/2005	7:40	
FT24	7/18/2005	9:30	
FT24	8/1/2005	8:40	
FT25	**6/20/2005**	**7:40**	
FT25	7/5/2005	7:40	
FT25	7/18/2005	10:50	
FT25	8/1/2005	10:00	
FT31	**6/20/2005**	**8:50**	
FT31	7/5/2005	8:30	
FT31	7/18/2005	11:50	
FT31	8/1/2005	13:00	
NSJ04	**6/15/2005**	**9:30**	
NSJ04	6/29/2005	12:50	
NSJ04	7/13/2005	11:00	
NSJ04	7/27/2005	10:40	

Site ID	Date	Time	Captan
NSJ28	**6/16/2005**	**9:10**	
NSJ28	6/30/2005	7:50	
NSJ28	7/14/2005	9:20	
NSJ28	7/28/2005	9:20	
NSJ31	**6/15/2005**	**10:40**	
NSJ31	6/29/2005	10:50	
NSJ31	7/13/2005	9:40	
NSJ31	7/27/2005	9:30	
NSJ32	**6/15/2005**	**13:00**	
NSJ32	6/29/2005	10:10	
NSJ32	7/13/2005	9:20	
NSJ32	7/27/2005	9:00	
NSJ34	**6/15/2005**	**8:40**	
NSJ34	6/29/2005	9:00	
NSJ34	7/13/2005	8:30	
NSJ34	7/27/2005	8:10	
NSJ36	**6/16/2005**	**10:20**	
NSJ36	6/30/2005	9:30	
NSJ36	7/14/2005	10:20	
NSJ36	7/28/2005	10:10	
NSJ38	**6/15/2005**	**7:30**	
NSJ38	6/29/2005	8:10	
NSJ38	7/13/2005	7:50	
NSJ38	7/27/2005	7:40	
SJC516	**6/16/2005**	**7:30**	
SJC516	6/30/2005	12:00	
SJC516	7/14/2005	7:30	
SJC516	7/28/2005	7:40	
SJC517	**7/14/2005**	**8:20**	
SJC517	7/28/2005	8:30	
SS05	**6/14/2005**	**13:20**	
SS05	6/28/2005	10:10	
SS05	7/12/2005	10:40	
SS05	7/26/2005	9:00	
SS09	**6/14/2005**	**14:40**	
SS09	6/28/2005	11:30	
SS09	7/12/2005	11:30	
SS09	7/26/2005	9:40	
SSJ03	**6/22/2005**	**11:10**	
SSJ03	7/7/2005	11:40	
SSJ03	7/20/2005	10:40	
SSJ03	8/3/2005	12:50	
SSJ04	**6/22/2005**	**9:50**	
SSJ04	7/7/2005	10:20	
SSJ04	7/20/2005	9:20	
SSJ04	8/3/2005	9:40	
SSJ07	**6/22/2005**	**8:40**	
SSJ07	7/7/2005	9:10	
SSJ07	7/20/2005	8:20	
SSJ07	8/3/2005	8:40	
SSJ10	**6/22/2005**	**13:00**	
SSJ10	7/7/2005	13:10	
SSJ10	7/20/2005	12:20	
SSJ10	8/3/2005	11:10	

Maximum value	0
Median	0
90th percentile	0
Number of samples	111
Frequency (%)	0

Table 14. Frequency of pesticide detection, Irrigation 2005

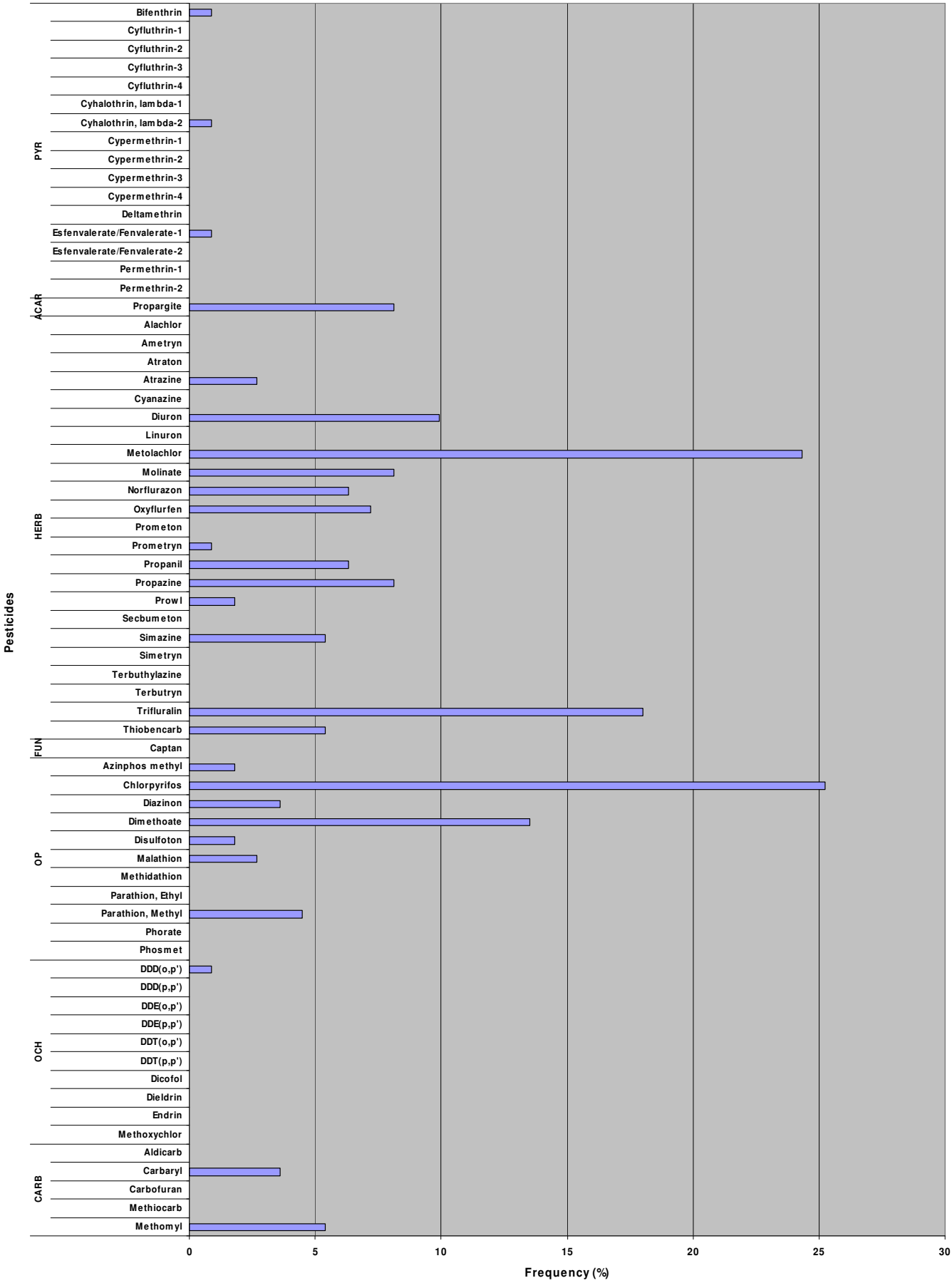

Table. 15 Summary of Water Column Toxicity detected during the Irrigation Season 2005

Site ID	Date	Time	*Ceriodaphnia dubia 96-hour survival (in %), (*indicates significant different to control group)*	*Pimephales promelas 96-hour survival (in %), (*indicates significant different to control group)*	*Selenastrum capricornutum (Y indicates significant different growth to control group)*
CS01	**06/13/05**	**8:30**	100	100	N
CS01	06/27/05	9:20	100	100	N
CS01	07/11/05	9:30	100	100	**Y**
CS01	07/25/05	8:00	100	100	N
CS12	**06/13/05**	**10:10**	**0*,a,b**	97.5	N
CS12	06/27/05	7:50	100	100	N
CS12	07/11/05	7:50	100	100	N
CS12	07/25/05	10:00	**0***	**92.5***	N
CS15	**06/13/05**	**13:30**	100	95	N
CS15	06/28/05	8:00	100	97.5	N
CS15	07/12/05	7:30	100	97.5	N
CS15	07/26/05	7:20	100	100	N
CS23	**06/13/05**	**12:20**	**0*,a,b**	90	N
CS23	06/28/05	7:20	100	100	N
CS23	07/12/05	8:30	100	100	N
CS24	**07/11/05**	**8:40**	100	100	N
CS24	07/25/05	9:10	**0***	100	N
CS06	**06/14/05**	**8:50**	95	**90***	N
CS06	06/27/05	10:40	100	100	N
CS06	07/11/05	11:00	100	97.5	N
CS06	07/25/05	11:50	100	97.5	N
CS11	**06/14/05**	**11:30**	90	95	N
CS11	06/27/05	13:00	100	97.5	N
CS11	07/11/05	13:00	100	97.5	N
CS11	07/25/05	14:20	100	100	N
SS09	**06/14/05**	**14:40**	95	95	N
SS09	06/28/05	11:30	95	97.5	N
SS09	07/12/05	11:30	100	100	N
SS09	07/26/05	9:40	100	100	N
SS05	**06/14/05**	**13:20**	**0*,a,b**	92.5	N
SS05	06/28/05	10:10	100	97.5	N
SS05	07/12/05	10:40	100	95	N
SS05	07/26/05	9:00	100	95.5	N
NSJ04	**06/15/05**	**9:30**	100	95	N
NSJ04	06/29/05	12:50	100	92.5	N
NSJ04	07/13/05	11:00	100	100	N
NSJ04	07/27/05	10:40	100	100	N
NSJ31	**06/15/05**	**10:40**	100	90	N
NSJ31	06/29/05	10:50	100	90	N
NSJ31	07/13/05	9:40	**0***	97.5	N
NSJ31	07/27/05	9:30	100	100	N
NSJ32	**06/15/05**	**13:00**	95	92.5	N
NSJ32	06/29/05	10:10	100	92.5	N
NSJ32	07/13/05	9:20	100	100	N
NSJ32	07/27/05	9:00	**0***	100	N
NSJ34	**06/15/05**	**8:40**	100	100	N
NSJ34	06/29/05	9:00	100	97.5	N
NSJ34	7/13/085	8:30	100	92.5	N
NSJ34	07/27/05	8:10	100	95	N
NSJ38	**06/15/05**	**7:30**	100	90	N
NSJ38	06/29/05	8:10	100	100	N
NSJ38	07/13/05	7:50	100	100	N
NSJ38	07/27/05	7:40	100	97.5	N

Table. 15 (cont'd) Summary of Water Column Toxicity detected during the Irrigation Season 2005

Site ID	Date	Time	*Ceriodaphnia dubia 96-hour survival (in %), (*indicates significant different to control group)*	*Pimephales promelas 96-hour survival (in %), (*indicates significant different to control group)*	*Selenastrum capricornutum (Y indicates significant different growth to control group)*
NSJ28	**06/16/05**	**9:10**	95	92.5	N
NSJ28	06/30/05	7:50	100	90.2	N
NSJ28	07/14/05	9:20	100	100	N
NSJ28	07/28/05	9:20	100	97.5	N
NSJ36	**06/16/05**	**10:20**	100	90	N
NSJ36	06/30/05	9:30	100	97.5	N
NSJ36	07/14/05	10:20	100	100	N
NSJ36	07/28/05	10:10	100	100	N
SJC516	**06/16/05**	**7:30**	100	100	N
SJC516	06/30/05	12:00	100	100	N
SJC516	07/14/05	7:30	100	100	N
SJC516	07/28/05	7:40	100	100	N
SJC517	**07/14/05**	**8:20**	100	100	N
SJC517	07/28/05	8:30	100	100	N
FT05	**06/20/05**	**15:10**	100	**82.5***	N
FT05	07/05/05	12:40	95	97.5	N
FT05	07/18/05	13:10	100	97.5	N
FT05	08/01/05	14:30	95	100	N
FT18	**06/20/05**	**11:50**	100	95	N
FT18	07/05/05	10:20	95	100	N
FT18	07/19/05	10:00	100	97.5	N
FT18	08/02/05	8:40	100	100	N
FT19	**06/20/05**	**14:00**	100	93	N
FT25	**06/20/05**	**7:40**	100	87.2	N
FT25	07/05/05	7:40	100	93	N
FT25	07/18/05	10:50	95	97.5	N
FT25	08/01/05	10:00	95	97.5	N
FT31	**06/20/05**	**8:50**	100	87.5	N
FT31	07/05/05	8:30	100	97.5	N
FT31	07/18/05	11:50	100	100	N
FT31	08/01/05	13:00	100	97.5	N
FT23	**06/21/05**	**7:30**	100	92.5	N
FT23	07/06/05	8:30	100	100	N
FT23	07/18/05	14:50	100	97.5	N
FT23	08/01/05	15:40	95	100	N
FT24	**06/21/05**	**9:20**	100	**92.5***	N
FT24	07/18/05	9:30	100	100	N
FT24	08/01/05	8:40	**0***	97.5	N
SSJ03	**06/22/05**	**11:10**	100	92.5	N
SSJ03	07/07/05	11:40	**0***	100	N
SSJ03	07/20/05	10:40	90	95	N
SSJ03	08/03/05	12:50	100	95	N
SSJ04	**06/22/05**	**9:50**	100	92.5	N
SSJ04	07/07/05	10:20	**0***	100	N
SSJ04	07/20/05	9:20	**5***	100	N
SSJ04	08/03/05	9:40	**0***	100	N
SSJ07	**06/22/05**	**8:40**	100	95	N
SSJ07	07/07/05	9:10	**0***	100	N
SSJ07	07/20/05	8:20	100	100	N
SSJ07	08/03/05	8:40	100	97.5	N
SSJ10	**06/22/05**	**13:00**	100	92.5	N
SSJ10	07/07/05	13:10	100	97.5	N
SSJ10	07/20/05	12:20	95	100	N
SSJ10	08/03/05	11:10	100	100	N
Total amount of samples			**107**	**107**	**107**
Frequency %			**12%**	**4%**	**1%**

a = All dead in 48 hours

b = Acute *Ceriodaphnia* TIE

Table 16. Summary of Nutrients detected during the Irrigation season 2005.
No values indicate no detection or values are below the quanification limit

Site ID	Date	Time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Phosphorus as P (µg/L)
CS01	**6/13/2005**	**8:30**				0.0108	10.5
CS01	6/27/2005	9:20	0.044			0.0114	16.1
CS01	7/11/2005	9:30				0.0107	15.3
CS01	7/25/2005	8:00	0.067	0.0098		0.0084	7.47
CS06	**6/14/2005**	**8:50**				0.0172	10.6
CS06	6/27/2005	10:40				0.0175	10.4
CS06	7/11/2005	11:00				0.0202	9.26
CS06	7/25/2005	11:50	0.05	0.0095		0.0152	6.86
CS11	**6/14/2005**	**11:30**	0.042	0.0601		0.0086	
CS11	6/27/2005	13:00		0.0217		0.0076	2.47
CS11	7/11/2005	13:00				0.0076	
CS11	7/25/2005	14:20	0.095	0.0091		0.0078	2.84
CS12	**6/13/2005**	**10:10**		0.566	0.0573	0.319	351
CS12	6/27/2005	7:50	0.107	0.499	0.024	0.228	245
CS12	7/11/2005	7:50	0.084	0.427	0.0246	0.239	264
CS12	7/25/2005	10:00	0.141	0.3	0.0288	0.407	479
CS15	**6/13/2005**	**13:30**	0.048	0.0482		0.102	246
CS15	6/28/2005	8:00		0.153		0.105	234
CS15	7/12/2005	7:30		0.0253		0.11	142
CS15	7/26/2005	7:20	0.053	0.0665	0.0057	0.102	155
CS23	**6/13/2005**	**12:20**	0.048	0.166	0.0092	0.11	943
CS23	6/28/2005	7:20		0.0368		0.0984	322
CS23	7/12/2005	8:30		0.0238		0.11	178
CS24	**7/11/2005**	**8:40**	0.074	1.68	0.0315	0.166	120
CS24	7/25/2005	9:10	0.119	0.497	0.0238	0.355	389
FT05	**6/20/2005**	**15:10**		0.0365		0.0106	11.7
FT05	7/5/2005	12:40	0.086	0.265	0.0139	0.115	126
FT05	7/18/2005	13:10	0.041	0.237		0.0073	10.9
FT05	8/1/2005	14:30		0.057		0.0095	9.37
FT18	**6/20/2005**	**11:50**				0.006	4.03
FT18	7/5/2005	10:20		0.0191		0.0076	4.81
FT18	7/19/2005	10:00		0.0058		0.0071	4.46
FT18	8/2/2005	8:40	0.042	0.0446		0.0086	2.23
FT19	**6/20/2005**	**14:00**		2.13	0.0548	0.0615	80.5
FT19	7/5/2005	12:00	0.058	0.0896	0.0055	0.105	151
FT23	**6/21/2005**	**7:30**	0.045	0.0628		0.0107	8.79
FT23	7/6/2005	8:30		0.0719		0.0134	12.2
FT23	7/18/2005	14:50		0.0353		0.0141	11.9
FT23	8/1/2005	15:40	0.057	0.0407		0.0163	15.7
FT24	**6/21/2005**	**9:20**	0.119	0.147	0.0117	0.0518	61.7
FT24	7/18/2005	9:30	0.125	0.102	0.0061	0.0665	116
FT24	8/1/2005	8:40	0.652	0.0906	0.0139	0.445	506
FT25	**6/20/2005**	**7:40**		0.0698		0.0169	92
FT25	7/5/2005	7:40	0.046	0.037		0.0127	88.6
FT25	7/18/2005	10:50		0.0441		0.0194	47.2
FT25	8/1/2005	10:00	0.064	0.0397		0.013	23.8
FT31	**6/20/2005**	**8:50**		0.0308		0.0085	11.3
FT31	7/5/2005	8:30		0.257		0.0091	23.6
FT31	7/18/2005	11:50		0.0282		0.0099	10.4
FT31	8/1/2005	13:00	0.041	0.0325		0.0104	6.97
NSJ04	**6/15/2005**	**9:30**	0.043	0.0178		0.0105	8.19
NSJ04	6/29/2005	12:50		0.0239		0.0088	8.7
NSJ04	7/13/2005	11:00		0.0425		0.0111	10.2
NSJ04	7/27/2005	10:40	0.046	0.0832		0.0116	10

Table 16. (cont'd) Summary of Nutrients detected during the Irrigation season 2005.
No values indicate no detection or values are below the quanification limit

Site ID	Date	Time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Phosphorus as P (µg/L)
NSJ28	**6/16/2005**	**9:10**	0.052	0.0895		0.0239	29.5
NSJ28	6/30/2005	7:50		0.0228		0.0237	37.7
NSJ28	7/14/2005	9:20	0.049	0.0238		0.024	38.9
NSJ28	7/28/2005	9:20	0.131	0.0973	0.0073	0.0651	99
NSJ31	**6/15/2005**	**10:40**				0.0119	11.5
NSJ31	6/29/2005	10:50				0.0125	16.9
NSJ31	7/13/2005	9:40				0.0124	17.6
NSJ31	7/27/2005	9:30	0.056	0.0072		0.0184	24.6
NSJ32	**6/15/2005**	**13:00**		3.32	0.0756	0.1	158
NSJ32	6/29/2005	10:10	0.042	1.76	0.0226	0.124	209
NSJ32	7/13/2005	9:20		3.41	0.0748	0.0964	178
NSJ32	7/27/2005	9:00	0.09	0.479	0.0506	0.109	142
NSJ34	**6/15/2005**	**8:40**	0.052			0.0339	88.6
NSJ34	6/29/2005	9:00				0.0318	69.7
NSJ34	7/13/2005	8:30	0.044			0.644	1011
NSJ34	7/27/2005	8:10	0.05			0.0588	773
NSJ36	**6/16/2005**	**10:20**		0.0197		0.0141	20
NSJ36	6/30/2005	9:30		0.0232		0.0189	23.9
NSJ36	7/14/2005	10:20		0.0158		0.0162	24.7
NSJ36	7/28/2005	10:10	0.084	0.0997		0.0586	98.5
NSJ38	**6/15/2005**	**7:30**	0.06	0.0217	0.0118	1.7	1785
NSJ38	6/29/2005	8:10	0.052			1.48	1845
NSJ38	7/13/2005	7:50	0.058			1.76	2065
NSJ38	7/27/2005	7:40	0.069			1.48	1667
SJC516	**6/16/2005**	**7:30**	0.238	0.72	0.0098	0.103	189
SJC516	6/30/2005	12:00	0.072	0.866	0.0141	0.0998	180
SJC516	7/14/2005	7:30	0.148	0.888	0.0189	0.123	193
SJC516	7/28/2005	7:40	0.137	1.18	0.0236	0.105	210
SJC517	**7/14/2005**	**8:20**	1.13	2.79	0.222	0.22	469
SJC517	7/28/2005	8:30	0.378	0.65	0.0335	0.35	515
SS05	**6/14/2005**	**13:20**	0.095	0.0831		0.0618	88.9
SS05	6/28/2005	10:10	0.044	0.0525		0.0299	63.7
SS05	7/12/2005	10:40		0.069		0.0386	56.7
SS05	7/26/2005	9:00	0.049	0.0708		0.0396	54.8
SS09	**6/14/2005**	**14:40**	1.7	0.016	0.01	0.115	177
SS09	6/28/2005	11:30	0.069	0.0237	0.0068	0.0896	128
SS09	7/12/2005	11:30	1.81	0.0376	0.0315	0.0645	96.1
SS09	7/26/2005	9:40	0.138	0.113	0.0529	0.0575	83.8
SSJ03	**6/22/2005**	**11:10**	0.072	0.109		0.0107	9.72
SSJ03	7/7/2005	11:40		0.0069		0.0109	13.3
SSJ03	7/20/2005	10:40	0.047	0.0064		0.0247	27
SSJ03	8/3/2005	12:50		0.0067		0.0154	9.36
SSJ04	**6/22/2005**	**9:50**	1.52	7.46	0.223	0.269	388
SSJ04	7/7/2005	10:20	0.11	1.85	0.0554	0.212	306
SSJ04	7/20/2005	9:20	0.586	3.31	0.106	0.177	332
SSJ04	8/3/2005	9:40	0.16	1.56	0.0864	0.225	313
SSJ07	**6/22/2005**	**8:40**	0.185	1.048	0.0831	0.0629	349
SSJ07	7/7/2005	9:10	0.718	3.76	0.21	0.214	416
SSJ07	7/20/2005	8:20	0.28	1.79	0.112	0.243	416
SSJ07	8/3/2005	8:40	0.243	1.11	0.0907	0.162	407
SSJ10	**6/22/2005**	**13:00**	0.067	1.84	0.0148	0.41	468
SSJ10	7/7/2005	13:10	0.06	4.69	0.0674	0.835	943
SSJ10	7/20/2005	12:20	0.428	4.09	0.0867	0.507	587
SSJ10	8/3/2005	11:10	0.166	1.02	0.0564	0.458	524
Maximum value			1.81	7.46	0.223	1.76	2065
Median			0.071	0.078	0.030	0.046	88.6
90th percentile			0.475	1.878	0.104	0.371	510.5
Number of samples			108	108	108	108	108
Frequency (%)			63.0	83.3	38.9	100.0	98.1

Table 17. Summary of Inorganic constituents detected during Irrigation 2005.
No values indicate that values are below the quantification limit

Site ID	Date	Time	Color (color units)	Hardness as CaCO3 (mg/L)	Total Dissolved Solids (mg/L)	Total Organic Carbon (mg/L)	Turbidity (NTU)
CS01	**6/13/2005**	**8:30**	8	125	151	4.26	3.9
CS01	6/27/2005	9:20	6	121	171	2.55	6.2
CS01	7/11/2005	9:30	7	130	155	2.34	6.7
CS01	7/25/2005	8:00	7	127	176	2.46	4.2
CS06	**6/14/2005**	**8:50**		35.4	61	1.02	3.8
CS06	6/27/2005	10:40	1.9	30.3	65	0.97	1.9
CS06	7/11/2005	11:00		47.5	62	0.90	2.9
CS06	7/25/2005	11:50		79.2	69	0.80	2.2
CS11	**6/14/2005**	**11:30**	10	28.3	53	2.26	2.1
CS11	6/27/2005	13:00	6	25.2	53	1.74	1.5
CS11	7/11/2005	13:00	7	25.2	39	1.56	1.7
CS11	7/25/2005	14:20	8	79.2	63	1.80	1.2
CS12	**6/13/2005**	**10:10**	55	80	137	7.50	10
CS12	6/27/2005	7:50	16	60.6	123	3.16	33
CS12	7/11/2005	7:50	18	60.9	95	3.22	50
CS12	7/25/2005	10:00	55	97.5	136	7.50	39
CS15	**6/13/2005**	**13:30**	8	68	164	1.48	150
CS15	6/28/2005	8:00	6	79.4	142	1.97	95
CS15	7/12/2005	7:30	7	65.3	120	1.61	70
CS15	7/26/2005	7:20	6	73.9	103	1.98	120
CS23	**6/13/2005**	**12:20**	10	170	369	2.57	390
CS23	6/28/2005	7:20	7	101	161	2.31	160
CS23	7/12/2005	8:30	6	67.3	143	1.98	70
CS24	**7/11/2005**	**8:40**	24	104	149	0.34	8.6
CS24	7/25/2005	9:10	36	74.2	128	5.30	3.8
FT05	**6/20/2005**	**15:10**	21	11.1	28	2.40	5.3
FT05	7/5/2005	12:40	13	15	36	2.67	6.9
FT05	7/18/2005	13:10	12	21.8	35	2.55	8.7
FT05	8/1/2005	14:30	11	12.2	25	2.50	6.2
FT18	**6/20/2005**	**11:50**	13	9.1	26	2.75	1.1
FT18	7/5/2005	10:20	12	8.5	23	2.36	1.4
FT18	7/19/2005	10:00	9	15.8	23	2.28	1.3
FT18	8/2/2005	8:40	9	10	21	2.15	1.2
FT19	**6/20/2005**	**14:00**	46	121	223	6.87	3.5
FT19	7/5/2005	12:00	60	105	170	1.90	12
FT23	**6/21/2005**	**7:30**	12	16.2	34	2.27	2.5
FT23	7/6/2005	8:30	11	15.8	30	2.44	2
FT23	7/18/2005	14:50	12	18.5	32	2.28	2.3
FT23	8/1/2005	15:40	11	14.9	31	2.10	4.1
FT24	**6/21/2005**	**9:20**	20	17.2	40	3.49	3.1
FT24	7/18/2005	9:30	30	21.8	47	4.78	2.9
FT24	8/1/2005	8:40	46	23.7	65	5.98	5.4
FT25	**6/20/2005**	**7:40**	12	14.4	28	2.33	12
FT25	7/5/2005	7:40	10	13.8	27	2.12	13
FT25	7/18/2005	10:50	16	13.2	26	2.40	9.5
FT25	8/1/2005	10:00	9	12.3	27	2.42	5.5
FT31	**6/20/2005**	**8:50**	11	13.3	26	2.66	2.5
FT31	7/5/2005	8:30	13	10	23	2.13	3.6
FT31	7/18/2005	11:50	11	14.8	22	2.28	2.4
FT31	8/1/2005	13:00	9	9	22	2.16	1.9
NSJ04	**6/15/2005**	**9:30**	16	73.7	103	15.93	1.4
NSJ04	6/29/2005	10:10	28	71	178	3.61	22
NSJ04	7/13/2005	11:00	14	71.3	103	3.93	0.8
NSJ04	7/27/2005	10:40	15	73.4	100	3.71	0.8

Table 17. (Cont'd) Summary of Inorganic constituents detected during Irrigation 2005.
No values indicate that values are below the quantification limit

Site ID	Date	Time	Color (color units)	Hardness as CaCO3 (mg/L)	Total Dissolved Solids (mg/L)	Total Organic Carbon (mg/L)	Turbidity (NTU)
NSJ28	**6/16/2005**	**9:10**	10	13.9	44	1.96	5.2
NSJ28	6/30/2005	7:50	8	22	44	0.36	6.6
NSJ28	7/14/2005	9:20	8	22.2	40	1.94	6.4
NSJ28	7/28/2005	9:20	15	32	66	2.83	16
NSJ31	**6/15/2005**	**10:40**	16	73.7	102	4.32	1.2
NSJ31	6/29/2005	10:50	14	72	105	4.29	1.5
NSJ31	7/13/2005	9:40	16	71.3	91	3.91	2.8
NSJ31	7/27/2005	9:30	18	74.1	105	4.01	1.9
NSJ32	**6/15/2005**	**13:00**	22	78.8	297	5.36	15
NSJ32	6/29/2005	10:10	15	82	102	5.81	1.2
NSJ32	7/13/2005	9:20	18	142	217	3.74	11
NSJ32	7/27/2005	9:00	37	81.9	128	5.92	9.4
NSJ34	**6/15/2005**	**8:40**	36.3	98	184	19.60	8.1
NSJ34	6/29/2005	9:00	23	26	57	4.09	9.7
NSJ34	7/13/2005	8:30	90	44.6	89	18.37	12
NSJ34	7/27/2005	8:10	41	51.6	83	11.80	29
NSJ36	**6/16/2005**	**10:20**		16.2	42	1.90	2.9
NSJ36	6/30/2005	9:30	7	17.5	38	1.84	3.4
NSJ36	7/14/2005	10:20	9	231	40	1.78	2.7
NSJ36	7/28/2005	10:10	17	32.5	75	2.84	9.5
NSJ38	**6/15/2005**	**7:30**	170	82.5	270	23.09	22
NSJ38	6/29/2005	8:10	140	117	311	18.89	23
NSJ38	7/13/2005	7:50	130	91.6	270	16.96	19
NSJ38	7/27/2005	7:40	160	91.8	290	20.80	6.2
SJC516	**6/16/2005**	**7:30**	14	61.6	156	3.35	22
SJC516	6/30/2005	12:00	14	95	226	3.26	20
SJC516	7/14/2005	7:30	14	103	258	3.65	21
SJC516	7/28/2005	7:40	18	135	288	3.19	25
SJC517	**7/14/2005**	**8:20**	27	218	498	6.11	75
SJC517	7/28/2005	8:30	55	221	512	9.49	30
SS05	**6/14/2005**	**13:20**	18	53.5	104	3.98	13
SS05	6/28/2005	10:10		60.6	75	1.49	25
SS05	7/12/2005	10:40	5	56.4	82	1.55	21
SS05	7/26/2005	9:00	7	59.1	94	1.78	17
SS09	**6/14/2005**	**14:40**	45	141	291	18.81	10
SS09	6/28/2005	11:30	37	168	318	14.87	8.2
SS09	7/12/2005	11:30	32	136	212	10.28	7.4
SS09	7/26/2005	9:40	23	116	179	6.62	8.9
SSJ03	**6/22/2005**	**11:10**	14	10.1	30	2.77	2.9
SSJ03	7/7/2005	11:40	13	8.91	24	2.49	3.1
SSJ03	7/20/2005	10:40	16	27.7	64	3.02	2.2
SSJ03	8/3/2005	12:50	14	16.2	42	2.39	2
SSJ04	**6/22/2005**	**9:50**	40	101	258	8.91	45
SSJ04	7/7/2005	10:20	24	121	292	4.70	66
SSJ04	7/20/2005	9:20	15	152	315	3.84	2.1
SSJ04	8/3/2005	9:40	38	136	303	6.40	60
SSJ07	**6/22/2005**	**8:40**	22	237	688	5.18	33
SSJ07	7/7/2005	9:10	22	228	642	8.54	29
SSJ07	7/20/2005	8:20	25	190	556	6.08	34
SSJ07	8/3/2005	8:40	29	238	618	5.44	40
SSJ10	**6/22/2005**	**13:00**	19	63.6	152	3.86	19
SSJ10	7/7/2005	13:10	16	107	260	5.70	34
SSJ10	7/20/2005	12:20	24	99	188	4.11	34
SSJ10	8/3/2005	11:10	20	66	156	4.24	31
Maximum value			170	238	688	23.09	390
Median			15	67.65	102.5	2.93	7.75
90th percentile			45.8	141.3	298.8	9.73	46.5
Number of samples			108	108	108	108	108
Frequency (%)			95.4	100	100	100	100

Table 18. Summary of trace Metals detected during Irrigation season 2005 (µg/L).
No value indicates values are below the RL and MDL

Site ID	Date	Time	Arsenic	Boron	Cadmium	Copper	Lead	Nickel	Selenium	Zinc
CS01	**6/13/2005**	**8:30**	1.01	0.0644		1.66	0.1	1.2	0.99	0.62
CS01	6/27/2005	9:20	1.17	0.106		1.69	0.15	1.46	0.57	0.7
CS01	7/11/2005	9:30	1.29	0.093		1.71	0.13	1.5	0.67	0.55
CS01	7/25/2005	8:00	1.71	0.0957		1.61	0.08	1.13	0.7	0.54
CS06	**6/14/2005**	**8:50**	0.13	0.0167		1.11	0.4	1.14	0.55	2.47
CS06	6/27/2005	10:40	0.17	0.018		0.93	0.31	0.9	0.29	1.92
CS06	7/11/2005	11:00	0.21	0.0205		0.84	0.28	0.8	0.18	1.28
CS06	7/25/2005	11:50	0.43	0.0208		0.79	0.25	0.75		1.34
CS11	**6/14/2005**	**11:30**	0.51	0.0046		1.39	0.06	1.05		0.63
CS11	6/27/2005	13:00	0.28	0.0042		1.23	0.05	0.8	0.43	0.32
CS11	7/11/2005	13:00	0.29	0.0034		1.18	0.05	0.69	0.41	0.15
CS11	7/25/2005	14:20	0.71	0.0049		1.71	0.04	0.53	0.89	0.5
CS12	**6/13/2005**	**10:10**	1.03		0.02	8.35	0.16	4.9	0.76	3.57
CS12	6/27/2005	7:50	0.85	0.0545	0.01	6.47	0.56	10.6	0.42	6.97
CS12	7/11/2005	7:50	0.65	0.0481	0.03	9.16	1.13	16.2	0.36	10.5
CS12	7/25/2005	10:00	1.23	0.0675	0.06	20.4	1.84	23.9	0.81	16.5
CS15	**6/13/2005**	**13:30**	1.34	0.166	0.08	27.9	4.34	27.9		35.5
CS15	6/28/2005	8:00	1.19	0.0555	0.05	21	3.15	20.9		28.7
CS15	7/12/2005	7:30	0.95	0.0536	0.02	9.25	1.33	8.18	0.45	10.4
CS15	7/26/2005	7:20	1.08	0.0436	0.05	12.3	2.13	16.6	0.69	17.4
CS23	**6/13/2005**	**12:20**	2.68	0.122	0.32	115	22.2	173		183
CS23	6/28/2005	7:20	1.47	0.0573	0.09	34.2	5.96	43.3		54.4
CS23	7/12/2005	8:30	2.41	0.0553	0.04	11.5	1.72	9.61		15
CS24	**7/11/2005**	**8:40**	0.71	0.0545		2.31	0.08	2.06	0.76	0.65
CS24	7/25/2005	9:10	1.17	0.0532		2.6	0.1	2.93	0.69	0.97
FT05	**6/20/2005**	**15:10**	0.43	0.0047		4.86	0.26	0.46	0.24	1.99
FT05	7/5/2005	12:40	0.48	0.013		6.66	0.32	0.65	0.26	2.73
FT05	7/18/2005	13:10	0.4	0.0041		13.9	0.42	0.56	0.16	3
FT05	8/1/2005	14:30	0.53	0.0032	0.02	6.04	0.37	0.5	0.18	2.83
FT18	**6/20/2005**	**11:50**	0.38	0.004		0.72	0.06	0.3	0.47	0.55
FT18	7/5/2005	10:20	0.24	0.0035		0.67	0.06	0.37	0.23	0.44
FT18	7/19/2005	10:00	0.31	0.0028		0.76	0.11	0.3	0.36	0.14
FT18	8/2/2005	8:40	0.44	0.0027		2.22	0.06	0.33	0.17	0.56
FT19	**6/20/2005**	**14:00**	1.45	0.0151	0.01	13.4	0.16	0.46	1	2.5
FT19	7/5/2005	12:00	1.88	0.0317	0.02	10.3	0.1	0.64	0.47	2.2
FT23	**6/21/2005**	**7:30**	0.6	0.0044		0.64	0.08	0.12	0.22	0.75
FT23	7/6/2005	8:30	0.48	0.0044		0.65	0.11	0.1	0.31	0.32
FT23	7/18/2005	14:50	0.45	0.0036		0.54	0.09	0.12	0.3	
FT23	8/1/2005	15:40	0.69	0.0036		0.79	0.25	0.25	0.44	0.85
FT24	**6/21/2005**	**9:20**	0.98	0.0107		0.99	0.24	0.3	0.38	1.55
FT24	7/18/2005	9:30	1.12	0.0154		1.84	0.86	0.66	0.46	3.43
FT24	8/1/2005	8:40	1.95	0.0227	0.02	4.42	0.24	1.8	1.4	4.79
FT25	**6/20/2005**	**7:40**	0.65	0.005	0.02	6.53	0.94	2.38	0.32	6.69
FT25	7/5/2005	7:40	0.53	0.0041	0.01	3.35	0.91	2.31	0.1	6.33
FT25	7/18/2005	10:50	0.56	0.0037		2.17	0.53	1.15		3.16
FT25	8/1/2005	10:00	0.53	0.0033	0.01	2.45	0.33	0.72	0.95	1.75
FT31	**6/20/2005**	**8:50**	0.48	0.0055		2.19	0.22	0.57	0.23	0.99
FT31	7/5/2005	8:30	0.41	0.0039		1.76	0.38	1.02		2.07
FT31	7/18/2005	11:50	0.31	0.003		0.96	0.19	0.42	0.29	0.33
FT31	8/1/2005	13:00	0.49	0.0028		1.54	0.18	0.4		0.84
NSJ04	**6/15/2005**	**9:30**	0.48	0.0232		1.58	0.07	0.82	0.93	0.63
NSJ04	6/29/2005	12:50	0.42	0.021		1.43	0.04	0.7	0.52	
NSJ04	7/13/2005	11:00	0.39	0.0176		1.4	0.05	0.69	0.58	
NSJ04	7/27/2005	10:40	0.5	0.0168		1.47	0.06	0.76		0.34

Table 18. (cont'd) Summary of trace Metals detected during Irrigation season 2005 (µg/L).
No value indicates values are below the RL and MDL

Site ID	Date	Time	Arsenic	Boron	Cadmium	Copper	Lead	Nickel	Selenium	Zinc
NSJ28	**6/16/2005**	**9:10**	0.46	0.0121	0.02	1.99	0.98	0.49	0.45	7.17
NSJ28	6/30/2005	7:50	0.49	0.0138	0.02	2.24	1.29	0.52	0.31	8.75
NSJ28	7/14/2005	9:20	0.45	0.0094	0.02	2.22	1.35	0.49	0.41	8.02
NSJ28	7/28/2005	9:20	1.03	0.0114	0.02	2.49	1.63	0.78		8.37
NSJ31	**6/15/2005**	**10:40**	0.48	0.0225		1.86	0.1	0.82	0.63	0.59
NSJ31	6/29/2005	10:50	0.58	0.0232		1.73	0.12	0.79	0.19	0.51
NSJ31	7/13/2005	9:40	0.54	0.0186		1.89	0.21	0.81	0.44	0.68
NSJ31	7/27/2005	9:30	0.7	0.0188		2.26	0.36	1.08	0.87	1.5
NSJ32	**6/15/2005**	**13:00**	1.88	0.0335		2.46	0.43	1.5	1.16	2.32
NSJ32	6/29/2005	10:10	1.74	0.0263		2.66	0.79	1.19	0.76	2.08
NSJ32	7/13/2005	9:20	1.73	0.0219		1.74	0.31	0.63	1.01	1.46
NSJ32	7/27/2005	9:00	1.27	0.0226		2.99	0.37	1.9	0.12	1.8
NSJ34	**6/15/2005**	**8:40**	2.15	0.0437		1.81	0.55	1.22	0.93	2.09
NSJ34	6/29/2005	9:00	1.03	0.0138		1.57	0.47	0.46	0.14	1.86
NSJ34	7/13/2005	8:30	2.81	0.0202	0.01	3	0.68	1.25	0.64	4.62
NSJ34	7/27/2005	8:10	2.62	0.0188	0.01	0.92	0.29	0.82	1.21	2.29
NSJ36	**6/16/2005**	**10:20**	0.36	0.0115	0.02	1.5	0.63	0.3	0.26	5.11
NSJ36	6/30/2005	9:30	0.45	0.0142	0.02	1.68	0.88	0.34	0.11	6.01
NSJ36	7/14/2005	10:20	0.39	0.0092	0.02	1.42	0.66	0.26	0.4	4.45
NSJ36	7/28/2005	10:10	1.04	0.0105	0.02	1.66	1.12	0.42	1.19	4.45
NSJ38	**6/15/2005**	**7:30**	4.55	0.0628	0.04	5.26	1.4	2.74	1.09	12.1
NSJ38	6/29/2005	8:10	5.12	0.0437		1.61	0.52	2.1	0.46	2.46
NSJ38	7/13/2005	7:50	5.37	0.0395		1.15	0.48	1.65	1.03	1.39
NSJ38	7/27/2005	7:40	4.86	0.0403	0.01	1.52	0.58	1.69	1.48	2.56
SJC516	**6/16/2005**	**7:30**	2.19	0.124	0.03	4.96	1.27	4.75	1.16	8.94
SJC516	6/30/2005	12:00	1.97	0.219	0.02	4.23	1.12	4.07	2.09	6.85
SJC516	7/14/2005	7:30	2.25	0.228	0.02	3.79	1.05	3.34	2.76	5.53
SJC516	7/28/2005	7:40	2.98	0.301	0.04	5.23	1.41	4.53	3.24	8.43
SJC517	**7/14/2005**	**8:20**	5.72	0.231	0.1	10.7	2.89	10.2	5.16	15.3
SJC517	7/28/2005	8:30	7.25	0.303	0.07	6.82	1.17	6.37	3.83	7.11
SS05	**6/14/2005**	**13:20**	1.68	0.0417	0.01	4.32	0.47	3.16	0.8	2.66
SS05	6/28/2005	10:10	1.22	0.0272	0.02	5.07	1.07	4.3	0.28	6.18
SS05	7/12/2005	10:40	1.48	0.0399	0.02	4.47	0.93	3.53	0.3	5.05
SS05	7/26/2005	9:00	1.79	0.0421	0.02	3.71	0.73	2.92	0.6	4.3
SS09	**6/14/2005**	**14:40**	7.27	0.173	0.03	16.1	0.45	8.98	1.23	2.55
SS09	6/28/2005	11:30	6.48	0.17	0.01	7.85	0.44	8.44	1.53	1.49
SS09	7/12/2005	11:30	6.18	0.121	0.01	6.23	0.34	5.89	0.87	1.38
SS09	7/26/2005	9:40	4.5	0.0972	0.01	3.6	0.33	4.7		1.74
SSJ03	**6/22/2005**	**11:10**	1.03	0.0693		7.43	0.16	0.22	0.73	0.86
SSJ03	7/7/2005	11:40	0.88	0.0084		3.71	0.12	0.19	0.31	0.52
SSJ03	7/20/2005	10:40	1.53	0.024		29.1	0.12	0.18	0.2	0.42
SSJ03	8/3/2005	12:50	1.39	0.0158		7.69	0.13	0.16		0.55
SSJ04	**6/22/2005**	**9:50**	6.78	0.0333	0.08	6.57	1.82	5.57	1.91	13.8
SSJ04	7/7/2005	10:20	6.31	0.243	0.07	6.77	2.57	5.69	1.99	20
SSJ04	7/20/2005	9:20	7.21	0.203	0.09	8.43	3.05	6.31	2.94	23.3
SSJ04	8/3/2005	9:40	6.23	0.207	0.08	6.08	2	3.91	2.38	13.7
SSJ07	**6/22/2005**	**8:40**	5.19	0.538	0.06	6.34	1.23	4	4.37	10.2
SSJ07	7/7/2005	9:10	5.58	0.527	0.05	5.25	1.11	4.26	5.13	9.1
SSJ07	7/20/2005	8:20	6.47	0.42	0.04	5.01	1.2	4.06	5.63	8.88
SSJ07	8/3/2005	8:40	7.12	0.494	0.07	6.22	1.37	3.99	5	9.64
SSJ10	**6/22/2005**	**13:00**	2.11	0.0342	0.03	4.75	1.1	2.92	0.84	27
SSJ10	7/7/2005	13:10	4.34	0.0637	0.04	8.89	1.6	5.85	0.73	15.8
SSJ10	7/20/2005	12:20	3.25	0.0399	0.03	6.5	1.8	3.87	0.7	13.2
SSJ10	8/3/2005	11:10	2.38	0.0049	0.03	5.23	1.39	3.18	1.47	10
Maximum value			7.27	0.538	0.32	115	22.2	173	5.63	183
Median			1.06	0.023	0.02	2.63	0.435	1.17	0.635	2.55
90th percentile			5.622	0.205	0.08	10.94	1.806	8.602	2.293	15.18
Number of samples			108	108	108	108	108	108	108	108
Frequency (%)			100	99.1	51.9	100	100	100	87.0	97.2

Table 19. Summary of Field Parameters taken during the Irrigation season 2005. NA means values not available

SiteID	Date	Time	Dissovled Oxygen (mg/L)	pH	EC (µS)	Water Temperature (℃)
CS01	**6/13/2005**	**8:30**	8.3	8.31	277	17.9
CS01	6/27/2005	9:20	8.9	8.11	281	19.7
CS01	7/11/2005	9:30	8.8	8.2	285	21.3
CS01	7/25/2005	8:00	7.1	8.06	288	21.6
CS06	**6/14/2005**	**8:50**	7.1	7.42	89.3	15.3
CS06	6/27/2005	10:40	9.3	7.62	95.2	16.4
CS06	7/11/2005	11:00	8.7	7.72	105.9	19.2
CS06	7/25/2005	11:50	8.6	7.91	111.2	20.2
CS11	**6/14/2005**	**11:30**	7.4	7.55	83.1	17.6
CS11	6/27/2005	13:00	9.1	7.49	80.6	19.4
CS11	7/11/2005	13:00	9.1	7.56	77.8	22.2
CS11	7/25/2005	14:20	7.4	8.31	107.2	32.4
CS12	**6/13/2005**	**10:10**	4.2	7.44	200	19.4
CS12	6/27/2005	7:50	7.8	7.26	188.8	18.3
CS12	7/11/2005	7:50	7.4	7.07	159.9	21.3
CS12	7/25/2005	10:00	5	7.29	206	23.8
CS15	**6/13/2005**	**13:30**	6.7	7.97	191.4	29.8
CS15	6/28/2005	8:00		7.63	174	18.6
CS15	7/12/2005	7:30	6.6	7.37	168.5	22.9
CS15	7/26/2005	7:20	6.2	7.35	141.6	22.1
CS23	**6/13/2005**	**12:20**	6.8	7.98	435	29.7
CS23	6/28/2005	7:20	8.4	7.62	172.3	17.9
CS23	7/12/2005	8:30	7	7.47	184.9	22.3
CS24	**7/11/2005**	**8:40**	3.9	6.83	283	23.5
CS24	7/25/2005	9:10	2.5	6.86	185	23.5
FT05	**6/20/2005**	**15:10**	7	8.05	34.4	25.3
FT05	7/5/2005	12:40	7.6	8.52	50.8	25.8
FT05	7/18/2005	13:10	7.7	8	47.8	29.1
FT05	8/1/2005	14:30	9	8.29	32.3	28.1
FT18	**6/20/2005**	**11:50**	8	7.23	30.4	14.3
FT18	7/5/2005	10:20	8.6	7.47	26.7	14.3
FT18	7/19/2005	10:00	9.2	7.36	25.6	15.4
FT18	8/2/2005	8:40	15	6.77	26.1	13.9
FT19	**6/20/2005**	**14:00**	14.8	9.45	312	32
FT19	7/5/2005	12:00	14.6	9.17	250	30.9
FT19	7/19/2005	9:10	1.2	6.83	232	25.5
FT19	8/2/2005	7:50	8.1	7.73	229	22.4
FT23	**6/21/2005**	**7:30**	8.6	7.28	48.4	16.3
FT23	7/6/2005	8:30	8.7	7.08	42.8	16.8
FT23	7/18/2005	14:50	8.7	8.58	43.5	19.8
FT23	8/1/2005	15:40	8	7.59	41.3	21.5
FT24	**6/21/2005**	**9:20**	4.5	6.88	60.8	20.6
FT24	7/6/2005	7:40	5.2	6.63	80.5	21.5
FT24	7/18/2005	9:30	5.2	6.55	74.6	26.1
FT24	8/1/2005	8:40	5.2	6.58	96.9	25.3
FT25	**6/20/2005**	**7:40**	8.8	7.4	35.6	14.6
FT25	7/5/2005	7:40	8.2	6.85	30.9	16.1
FT25	7/18/2005	10:50	8.4	7.32	30.5	18.9
FT25	8/1/2005	10:00	8	7.02	34.6	19.4
FT31	**6/20/2005**	**8:50**	8.8	7.05	32.4	13.7
FT31	7/5/2005	8:30	8.8	6.68	28.3	15.2
FT31	7/18/2005	11:50	8.2	6.95	26.3	18.4
FT31	8/1/2005	13:00	8	6.95	24.5	20.6
NSJ04	**6/15/2005**	**9:30**	7.9	7.82	186.3	20
NSJ04	6/29/2005	12:50	8	7.9	186.6	19.6
NSJ04	7/13/2005	11:00	6.6	7.67	181.7	21.9
NSJ04	7/27/2005	10:40	6	7.3	182.4	19.8

Table 19. (cont'd) Summary of Field Parameters taken during the Irrigation
NA means values not available

SiteID	Date	Time	Dissovled Oxygen (mg/L)	pH	EC (µS)	Water Temperature (°C)
NSJ28	**6/16/2005**	**9:10**	7	6.85	60.4	15.5
NSJ28	6/30/2005	7:50	6.1	7	60.1	17.9
NSJ28	7/14/2005	9:20	7.4	7.07	62	19
NSJ28	7/28/2005	9:20	6.9	6.75	92	21.2
NSJ31	**6/15/2005**	**10:40**	9.6	8.13	186	22.5
NSJ31	6/29/2005	10:50	6.8	7.51	192.3	21.5
NSJ31	7/13/2005	9:40	7.4	7.77	184.1	24.6
NSJ31	7/27/2005	9:30	7.8	7.53	186.2	23
NSJ32	**6/15/2005**	**13:00**	1.9	7.76	418	25.9
NSJ32	6/29/2005	10:10	7.8	7.04	232	23.4
NSJ32	7/13/2005	9:20	4.2	7.19	378	25.6
NSJ32	7/27/2005	9:00	4.1	6.67	214	23.1
NSJ34	**6/15/2005**	**8:40**	7.2	7.49	290	19.7
NSJ34	6/29/2005	9:00	6.4	6.56	67	23.6
NSJ34	7/13/2005	8:30	0.6	5.98	127.2	24.2
NSJ34	7/27/2005	8:10	1.1	5.78	125.2	21.3
NSJ36	**6/16/2005**	**10:20**	9.1	7.13	58.6	15.4
NSJ36	6/30/2005	9:30	6	7.01	58.2	17.4
NSJ36	7/14/2005	10:20	7.8	7.02	57.2	18.1
NSJ36	7/28/2005	10:10	16.2	6.89	121.9	21
NSJ38	**6/15/2005**	**7:30**	5.3	6.93	296	17.2
NSJ38	6/29/2005	8:10	2.5	6.8	324	18.2
NSJ38	7/13/2005	7:50	2.7	6.86	325	23.1
NSJ38	7/27/2005	7:40	2.4	6.62	340	20
SJC516	**6/16/2005**	**7:30**	7.8	6.87	229	18.5
SJC516	6/30/2005	12:00	6.8	7.47	379	23.2
SJC516	7/14/2005	7:30	7.4	7.34	436	22.9
SJC516	7/28/2005	7:40	8.3			
SJC517	**7/14/2005**	**8:20**	3.9	6.93	852	23.4
SJC517	7/28/2005	8:30	2.1			
SS05	**6/14/2005**	**13:20**	4.6	7.2	174.4	24.5
SS05	6/28/2005	10:10	6.1	7.34	121.2	19.9
SS05	7/12/2005	10:40	6	7.53	146.4	24.2
SS05	7/26/2005	9:00	7	7.45	157.3	22.7
SS09	**6/14/2005**	**14:40**	4.8	7.64	438	29.2
SS09	6/28/2005	11:30	6.3	7.61	499	22.4
SS09	7/12/2005	11:30	6.7	7.25	380	28.8
SS09	7/26/2005	9:40	7.6	7.32	277	26.6
SSJ03	**6/22/2005**	**11:10**	8.6	6.87	41.4	20.2
SSJ03	7/7/2005	11:40	7.7	6.82	29.3	23.1
SSJ03	7/20/2005	10:40	13.4	7.1	98.1	22.8
SSJ03	8/3/2005	12:50	6.4	7.12	58.3	24
SSJ04	**6/22/2005**	**9:50**	6.7	7.26	360	20.3
SSJ04	7/7/2005	10:20	5.8	7.28	462	23.2
SSJ04	7/20/2005	9:20	4.8	7.41	470	23.8
SSJ04	8/3/2005	9:40	4.3	7.15	473	22.8
SSJ07	**6/22/2005**	**8:40**	5.2	6.94	1047	19.9
SSJ07	7/7/2005	9:10	5.6	7.07	1049	23.1
SSJ07	7/20/2005	8:20	4.8	7.14	899	24.4
SSJ07	8/3/2005	8:40	4.5	7.11	1034	23.5
SSJ10	**6/22/2005**	**13:00**	5.6	7.42	211	21.5
SSJ10	7/7/2005	13:10	9.6	7.98	363	32.3
SSJ10	7/20/2005	12:20	6	7.6	272	25.7
SSJ10	8/3/2005	11:10	5.3	7.14	220	23.2
Maximum value			16.2	9.45	1049	32.4
Minimum value			0.6	5.78	24.5	13.7
Median			7.1	7.3	174	21.5
90th percentile			9.1	8.052	435.2	26.2
Number of samples			111	111	111	111
Frequency (%)			99.1	98.2	98.2	98.2

Analytical Quality Assurance/Quality Control Results

Between June 13 and August 3, 2005, 555 water samples were collected for analysis of seven classes of pesticides. Additional samples were collected for the purpose of quality control. Thirty field blanks, thirty field duplicates, and thirty samples for matrix spikes were collected (see Appendix I, Tables 20-28).

The results for both matrix spike (and matrix spike duplicates) and lab controlled spike (and lab controlled spike duplicates) for pesticides are summarized in tables 20 and 21 (Appendix I). The average percent recovery for each pesticide is given, as well as the standard deviation. Percent recoveries ranged between 70.2 and 108. With the exception of deltamethrin, matrix spikes and lab controlled spikes were not run on pesticides that were screened.

There were no herbicides, organophosphates, carbamates, pyrethroids, organochlorines, or fungicides detected in any of the field blanks. The acaricide propargite was detected in one field blank. Since there were no detectable levels found in the corresponding environmental sample, it is likely that the samples were accidentally switched. The acaricide field blank was given the qualifier code IP (analyte detected in method, trip, or equipment blank).

None of the field duplicates analyzed for carbamates, acaricides, pyrethroids, organochlorines, and fungicides had percent recovery differences (RPD) that exceeded 25%. Two field duplicates analyzed for organophosphates were not calculable because the values were below the reporting limit. Among the field duplicates analyzed for herbicides, five RPD values were not calculable and three RPD values exceeded the acceptable limit of 25%. All RPD values exceeding 25% received the qualifier code FDP (field duplicate RPD above QC limit) and belonged to herbicides that were analyzed at screening level only.

Five field duplicates and five field blanks were collected in addition to the 107 water column toxicity samples (Table 33). Comparison of field duplicates with their respective environmental samples revealed similar results for all five sets of samples. Only one site (SS05) showed significantly different survival from the control group. All field blanks consisted of water provided to us by Aqua Science and showed no significant differences in survival of *Ceriodaphnia dubia* and *Pimephales promelas*, or growth of *Selenastrum capricornutum* compared to control groups.

Both field duplicates and field blanks were taken for physical parameters, nutrients, and hardness (n=5 for each field blanks and field duplicates) (Table 29). No analytes were detected in any physical parameter field blanks. The RPD for one field duplicate (analyte=color; SJC516) exceeded the acceptable limit of 25%. Five samples were spiked for color. The mean recovery and standard deviation is 91.4±5.5

Among the nutrient quality control samples, one of five field blanks (CS24) showed a detectable, but not quantifiable amount of ammonia (0.055 DNQ mg/L). None of the 5 field duplicates collected for nutrients exceeded relative percent differences of 25%. Five samples of nutrients were spiked. The mean recovery and standard deviation for nutrients are: color 91.4%±5.5, ammonia 98.0%±5.7, nitrate+nitrite 98.0%±8.8, nitrite 100.2%±2.5, and orthophosphate

100.5%±0.8. Six samples were spiked for phosphorus, the mean recovery and standard deviation is 98±17.6.

A total of ten quality control samples were taken for hardness (Table 29). No $CaCO_3$ was detected in any of the field blanks and none of the duplicates relative percent differences exceeded 25%.

Ten additional samples were collected for TOC, five field blanks and five field duplicates (Table 31). All five field blanks showed carbon detections, but the values were either below method detection limits or below reporting limits. One of the field duplicates (NSJ32) exceeded a relative percent difference of 25% and received the qualifier code FDP (field duplicate RPD above QC limit).

Five blanks were prepared with MilliQ-water, four as field blanks and one as a travel blank (Table 32). The four field blanks had detection of several trace metals. The qualifier code IP (analyte detected in method, trip or equipment blank) was given to those blank samples in the database. There is no pattern for the contamination excluding the MilliQ-water as a source of contamination. Several different individuals filled the sample containers so it is unlikely the field crews contaminated the samples. To determine if the source of contamination was the acidification process done by UCD staff, one lab blank each was produced with (LBA) and without acidification (LBNA). Both samples list several detections, but with fewer metal detections are shown in the blank that was acidified. The travel blank (taken on 7/7/2005) was not received by the Moss Landing lab. The field crew is certain that the sample was collected and the chain of custody shows the sample record; we are uncertain as to how the sample was lost.

Six samples were spiked for all metals, except boron. Seven separate samples were spiked for boron. The mean recovery rates and standard deviations for the different metals are as follows: Boron 101±4.1, arsenic 93±9.3, cadmium 105±6.8, copper 99±5.7, nickel 97±2.5, lead 96±7.1, selenium 97±10.3, zinc 102±6.3.

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APPENDIX I. QUALITY ASSURANCE/QUALITY CONTROL

Table 20. Mean percent recoveries and standard deviations of percent recoveries for pesticide quality assurance matrix spikes and matrix spike duplicates

Herbicides by GC/TSD; 10 or 12 MS/MSD samples analyzed	MS/MSD Mean (in %)	Standard deviation	SWAMP Qualifier Code additions
Atrazine	90.5	11.8	1 of 12 samples GB
Cyanazine	91.3	12.6	2 of 12 samples GB
Diuron	89.4	10.7	0 of 10 samples
Linuron	83.9	11.2	2 of 10 samples GB
Molinate	76.9	12.3	5 of 12 samples GB
Simazine	94.4	11.4	0 of 12 samples
Thiobencarb	84.1	8.9	2 of 10 samples GB and 2 of 10 samples NA because BB
Organophosphate Pesticides by GC/FPD; 12 MS/MSD samples analyzed	**MS/MSD Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Azinphos methyl	98.0	11.5	
Chlorpyrifos	102.0	7.3	
Diazinon	96.6	5.6	
Dimethoate	99.4	5.7	
Disulfoton	74.0	6.4	6 of 12 samples GB
Malathion	108.0	6.5	
Methidathion	103.0	8.3	
Parathion, Methyl	100.8	3.5	
Phorate	91.9	9.6	
Phosmet	103.1	9.3	
Parathion, Ethyl	101.7	6.5	
Carbamates by LCMS; 10 MS/MSD samples analyzed	**MS/MSD Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Aldicarb	84.4	16.1	4 of 10 samples GB
Carbaryl	92.7	17.6	2 of 10 samples GB
Carbofuran	85.7	14.1	3 of 10 samples GB
Methiocarb	89.6	16.1	2 of 10 samples GB
Methomyl	83.0	10.6	2 of 10 samples GB
Pyrethroid Pesticides by GC/ECD; 14 MS/MSD samples analyzed	**MS/MSD Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Bifenthrin	100.5	9.3	
Cyfluthrin-1	91.6	9.7	
Cyfluthrin-2	100.0	9.6	
Cyfluthrin-3	95.1	7.8	
Cyfluthrin-4	91.0	10.2	
Cypermethrin-1	93.2	7.9	
Cypermethrin-2	93.0	9.1	
Cypermethrin-3	95.0	12.2	
Cypermethrin-4	85.9	12.1	3 of 14 samples GB
Deltamethrin*	79.6	26.4	5 of 14 samples GB
Esfenvalerate/Fenvalerate-1	95.2	7.3	
Esfenvalerate/Fenvalerate-2	95.6	9.6	
Permethrin-1	90.2	7.3	
Permethrin-2	94.5	9.4	
Cyhalothrin, lambda-1	103.5	6.6	
Cyhalothrin, lambda-2	97.3	10.5	
Organochlorine Pesticides by GC/ECD; 12 MS/MSD samples analyzed	**MS/MSD Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
DDD(o,p')	92.5	8.1	
DDD(p,p')	94.2	4.3	
DDE(o,p')	94.6	9.6	
DDE(p,p')	90.5	8.1	
DDT(o,p')	90.1	16.4	4 of 12 samples GB
DDT(p,p')	99.7	12.9	
Dicofol	87.0	13.8	1of 12 samples GB
Dieldrin	89.7	6.9	
Endrin	91.6	19.5	4 of 12 samples GB
Methoxychlor	94.9	8.2	
Fungicides by LCMS; 10 MS/MSD samples analyzed	**MS/MSD Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Captan	78.5	13.5	4 of 10 samples GB

* Pesticides analyzed by DFG-WPCL at screening level only

GB = Matrix spike recovery not within control limits

BB = Sample > 4x spike concentration

NA = not available

Table 21. Mean percent recoveries and standard deviations of percent recoveries for pesticide lab control spikes

Herbicides by GC/TSD; 6 or 7 LCS/LCSD samples analyzed	**LCS/LCSD Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Atrazine	84.5	9.8	1 of 6 samples EUM
Cyanazine	81.9	12.6	3 of 6 sampls EUM
Diuron	89.6	15.7	1 of 7 samples EUM
Linuron	88.5	21.0	4 of 7 sampls EUM
Molinate	80.4	6.0	1 of 6 samples EUM
Simazine	81.4	6.7	1 of 6 samples EUM
Thiobencarb	86.8	5.8	0 of 6 samples
Organophosphate Pesticides by GC/FPD; 6 LCS samples analyzed	**LCS Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Azinphos methyl	93.6	8.4	
Chlorpyrifos	95.4	5.6	
Diazinon	92.5	8.9	
Dimethoate	81.8	9.3	1 of 6 samples EUM
Disulfoton	70.2	16.9	5 of 6 samples EUM
Malathion	99.1	5.1	
Methidathion	93.1	10.0	
Parathion, Methyl	96.7	8.1	
Phorate	82.7	5.6	1 of 6 samples EUM
Phosmet	86.4	11.5	1 of 6 samples EUM
Parathion, Ethyl	97.4	3.7	
Carbamates by LCMS; 6 LCS/1 LCSD samples analyzed	**LCS/LCSD Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Aldicarb	85.0	11.8	1 of 7 samples EUM
Carbaryl	96.3	18.6	1 of 7 samples EUM
Carbofuran	97.3	17.4	
Methiocarb	95.0	19.7	1 of 7 samples EUM
Methomyl	91.0	9.2	
Pyrethroid Pesticides by GC/ECD; 7 LCS samples analyzed	**LCS Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Bifenthrin	97.7	13.7	1 of 7 samples EUM
Cyfluthrin-1	91.6	14.2	
Cyfluthrin-2	93.3	14.4	
Cyfluthrin-3	89.1	13.5	
Cyfluthrin-4	84.1	14.0	1 of 7 samples EUM
Cypermethrin-1	86.8	11.0	
Cypermethrin-2	85.1	15.6	1 of 7 samples EUM
Cypermethrin-3	86.6	10.4	
Cypermethrin-4	82.2	14.3	2 of 7 samples EUM
Deltamethrin*	76.4	34.9	3 of 7 samples EUM
Esfenvalerate/Fenvalerate-1	93.2	13.2	1 of 7 samples EUM
Esfenvalerate/Fenvalerate-2	93.2	14.8	1 of 7 samples EUM
Permethrin-1	91.9	9.2	
Permethrin-2	88.8	5.5	
Cyhalothrin, lambda-1	95.0	9.9	
Cyhalothrin, lambda-2	83.5	10.2	1 of 7 samples EUM
Organochlorine Pesticides by GC/ECD; 6 LCS samples analyzed	**LCS Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
DDD(o,p')	87.6	9.0	1 of 6 samples EUM
DDD(p,p')	86.7	12.1	1 of 6 samples EUM
DDE(o,p')	94.6	9.1	
DDE(p,p')	97.7	10.6	
DDT(o,p')	101.1	10.1	
DDT(p,p')	100.1	13.4	
Dicofol	96.6	6.3	
Dieldrin	88.6	6.3	
Endrin	93.0	20.4	2 of 6 samples EUM
Methoxychlor	94.0	7.8	
Fungicides by LCMS; 6 LCS/1 LCSD samples analyzed	**LCS Mean (in %)**	**Standard deviation**	**SWAMP Qualifier Code additions**
Captan	85.4	9.2	1 of 7 samples EUM

* Pesticides analyzed by DFG-WPCL at screening level only

EUM = LCS is outside of acceptance limits

Table 22. Summary of Pesticide Field QA / QC data for the Irrigation Season 2005 (in µg/L).
Herbicide Pesticides

	Site ID	Collection Date	Collection Time	Atrazine	Cyanazine	Simazine	Molinate	Thiobencarb	Trifluralin**	Atraton**	Prometon**	Propazine**	Terbuthylazine**	Secbumeton**	Propanil**	Alachlor**	Simetryn**	Ametryn**	Prometryn**	Terbutryn**	Metolachlor**	Prowl**	Norflurazon**	Oxyfluorfen**
Field Duplicates																								
Concentration in ppb (µg/L)	**SS05**	14/Jun/2005	13:20	**0.032***	ND	ND	**0.059**	**150**	ND	ND	ND	ND	ND	ND	**1.17**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SS05**	14/Jun/2005	13:23	**0.030***	ND	ND	**0.058**	**150**	ND	ND	ND	ND	ND	ND	**0.821**	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD							2	0							35***									
Concentration in ppb (µg/L)	**FT23**	21/Jun/2005	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT23**	21/Jun/2005	7:33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD																								
Concentration in ppb (µg/L)	**FT25**	05/Jul/2005	7:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT25**	05/Jul/2005	7:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD																								
Concentration in ppb (µg/L)	**SSJ04**	20/Jul/2005	9:20	ND	ND	ND	ND	ND	**0.167**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.138**	**0.325**	ND	**0.142**
Concentration in ppb (µg/L)	**SSJ04**	20/Jul/2005	9:23	ND	ND	ND	ND	ND	**0.194**	ND	ND	**0.027**	ND	ND	ND	ND	ND	ND	ND	ND	**0.142**	**0.182**	ND	**0.209**
RPD									15			NC									3	56***		38***
Concentration in ppb (µg/L)	**NSJ31**	27/Jul/2005	9:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ31**	27/Jul/2005	9:33	ND	ND	**0.041***	ND	ND	ND	ND	ND	**0.017***	ND	ND	ND	ND	ND	ND	ND	ND	**0.148**	ND	**0.273**	ND
RPD						NC						NC									NC		NC	
Concentration in ppb (µg/L)	**SJC516**	28/Jul/2005	7:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SJC516**	28/Jul/2005	7:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD																								
Field Blanks																								
Concentration in ppb (µg/L)	**CS12**	13/Jun/2005	10:11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT24**	06/Jul/2005	7:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS11**	11/Jul/2005	13:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT24**	01/Aug/2005	8:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ04**	03/Aug/2005	9:41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

***Results are below reporting limit**

**** Pesticides analyzed by DFG-WPCL at screening level only**

*****Field duplicate RPD above QC limit**

NC=Not calculable

Table 22. (Cont'd) Summary of Pesticide Field QA / QC data for the Irrigation Season 2005 (in µg/L). Herbicide Pesticides

	Site ID	Collection Date	Collection Time	Linuron	Diuron
Field Duplicates					
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:30	ND	ND
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:33	ND	ND
RPD					
Concentration in ppb (µg/L)	**FT05**	20/Jun/2005	15:10	ND	ND
Concentration in ppb (µg/L)	**FT05**	20/Jun/2005	15:13	ND	ND
RPD					
Concentration in ppb (µg/L)	**CS06**	27/Jun/2005	10:40	ND	ND
Concentration in ppb (µg/L)	**CS06**	27/Jun/2005	10:43	ND	ND
RPD					
Concentration in ppb (µg/L)	**CS06**	11/Jul/2005	11:00	ND	ND
Concentration in ppb (µg/L)	**CS06**	11/Jul/2005	11:03	ND	ND
RPD					
Concentration in ppb (µg/L)	**CS24**	25/Jul/2005	9:10	ND	ND
Concentration in ppb (µg/L)	**CS24**	25/Jul/2005	9:13	ND	ND
RPD					
Concentration in ppb (µg/L)	**FT31**	01/Aug/2005	13:00	ND	ND
Concentration in ppb (µg/L)	**FT31**	01/Aug/2005	13:03	ND	ND
RPD					
Field Blanks					
Concentration in ppb (µg/L)	**CS15**	13/Jun/2005	13:31	ND	ND
Concentration in ppb (µg/L)	**SSJ04**	22/Jun/2005	9:51	ND	ND
Concentration in ppb (µg/L)	**CS01**	27/Jun/2005	9:21	ND	ND
Concentration in ppb (µg/L)	**FT05**	18/Jul/2005	13:11	ND	ND
Concentration in ppb (µg/L)	**SS09**	26/Jul/2005	9:41	ND	ND
Concentration in ppb (µg/L)	**SJC517**	28/Jul/2005	8:31	ND	ND

Table 23. Summary of Pesticide Field QA / QC data for the Irrigation Season 2005 (in µg/L). Organophosphate Pesticides

	Site ID	Collection Date	Collection Time	Azinphos methyl	Chlorpyrifos	Diazinon	Dimethoate	Disulfoton	Malathion	Methidathion	Parathion, Methyl	Phorate	Phosmet	Parathion, Ethyl
Field Duplicates														
Concentration in ppb (µg/L)	**CS23**	13/Jun/2005	12:20	ND	ND	**2.00**	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS23**	13/Jun/2005	12:23	ND	ND	**1.95**	ND	ND	ND	ND	ND	ND	ND	ND
RPD						3								
Concentration in ppb (µg/L)	**SS09**	28/Jun/2005	11:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SS09**	28/Jun/2005	11:33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD														
Concentration in ppb (µg/L)	**NSJ38**	29/Jun/2005	8:10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ38**	29/Jun/2005	8:13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD														
Concentration in ppb (µg/L)	**SSJ10**	20/Jul/2005	12:20	ND	ND	ND	**0.040***	**0.017***	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ10**	20/Jul/2005	12:23	ND	ND	ND	**0.046***	**0.020***	ND	ND	ND	ND	ND	ND
RPD							NC	NC						
Concentration in ppb (µg/L)	**NSJ34**	27/Jul/2005	8:10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ34**	27/Jul/2005	8:13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD														
Concentration in ppb (µg/L)	**FT23**	01/Aug/2005	15:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT23**	01/Aug/2005	15:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD														
Field Blanks														
Concentration in ppb (µg/L)	**CS01**	13/Jun/2005	8:31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT18**	20/Jun/2005	11:51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ10**	07/Jul/2005	13:11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS15**	12/Jul/2005	7:31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS11**	25/Jul/2005	14:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS15**	26/Jul/2005	7:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* Results below reporting limit

Table 24. Summary of Pesticide Field QA / QC data for the Irrigation Season 2005 (in µg/L).
Carbamate Pesticides

	Site ID	Collection Date	Collection Time	Aldicarb	Carbaryl	Carbofuran	Methiocarb	Methomyl
Field Duplicates								
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:30	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:33	ND	ND	ND	ND	ND
RPD								
Concentration in ppb (µg/L)	**FT05**	20/Jun/2005	15:10	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT05**	20/Jun/2005	15:13	ND	ND	ND	ND	ND
RPD								
Concentration in ppb (µg/L)	**CS06**	27/Jun/2005	10:40	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS06**	27/Jun/2005	10:43	ND	ND	ND	ND	ND
RPD								
Concentration in ppb (µg/L)	**CS06**	11/Jul/2005	11:00	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS06**	11/Jul/2005	11:03	ND	ND	ND	ND	ND
RPD								
Concentration in ppb (µg/L)	**CS24**	25/Jul/2005	9:10	ND	**3.60**	ND	ND	ND
Concentration in ppb (µg/L)	**CS24**	25/Jul/2005	9:13	ND	**4.40**	ND	ND	ND
RPD					20			
Concentration in ppb (µg/L)	**FT31**	01/Aug/2005	13:00	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT31**	01/Aug/2005	13:03	ND	ND	ND	ND	ND
RPD								
Field Blanks								
Concentration in ppb (µg/L)	**CS15**	13/Jun/2005	13:31	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ04**	22/Jun/2005	9:51	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS01**	27/Jun/2005	9:21	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT05**	18/Jul/2005	13:11	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SS09**	26/Jul/2005	9:41	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SJC517**	28/Jul/2005	8:31	ND	ND	ND	ND	ND

Table 25. Summary of Pesticide Field QA / QC data for the Irrigation Season (in µg/L).

Acaricide Pesticides

	Site ID	Collection Date	Collection Time	Propagite*
Field Duplicates				
Concentration in ppb (µg/L)	**SS05**	14/Jun/2005	13:20	ND
Concentration in ppb (µg/L)	**SS05**	14/Jun/2005	13:23	ND
RPD				
Concentration in ppb (µg/L)	**FT23**	21/Jun/2005	7:30	ND
Concentration in ppb (µg/L)	**FT23**	21/Jun/2005	7:33	ND
RPD				
Concentration in ppb (µg/L)	**FT25**	05/Jul/2005	7:40	ND
Concentration in ppb (µg/L)	**FT25**	05/Jul/2005	7:43	ND
RPD				
Concentration in ppb (µg/L)	**SSJ04**	20/Jul/2005	9:20	ND
Concentration in ppb (µg/L)	**SSJ04**	20/Jul/2005	9:23	ND
RPD				
Concentration in ppb (µg/L)	**NSJ31**	27/Jul/2005	9:30	ND
Concentration in ppb (µg/L)	**NSJ31**	27/Jul/2005	9:33	ND
RPD				
Concentration in ppb (µg/L)	**SJC516**	28/Jul/2005	7:40	ND
Concentration in ppb (µg/L)	**SJC516**	28/Jul/2005	7:43	ND
RPD				
Field Blanks				
Concentration in ppb (µg/L)	**CS12**	13/Jun/2005	10:11	ND
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:31	ND
Concentration in ppb (µg/L)	**FT24**	06/Jul/2005	7:41	ND
Concentration in ppb (µg/L)	**CS11**	11/Jul/2005	13:01	**0.5****
Concentration in ppb (µg/L)	**FT24**	01/Aug/2005	8:41	ND
Concentration in ppb (µg/L)	**SSJ04**	03/Aug/2005	9:41	ND

* Pesticides analyzed by DFG-WPCL at screening level only

** IP- analyte detected in method, trip or equipment blank

Table 26. Summary of Pesticide Field QA / QC data for the Irrigation Season 2005 (in µg/L). Pyrethroid Pesticides

	Site ID	Collection Date	Collection Time	Bifenthrin	Cyfluthrin-1	Cyfluthrin-2	Cyfluthrin-3	Cyfluthrin-4	Cypermethrin-1	Cypermethrin-2	Cypermethrin-3	Cypermethrin-4	*Deltamethrin***	Esfenvalerate/Fenvalerate-1	Esfenvalerate/Fenvalerate-2	Permethrin-1	Permethrin-2	Lambda cyhalothrin-1	Lambda cyhalothrin-2
Field Duplicates																			
Concentration in ppb (µg/L)	**NSJ38**	15/Jun/2005	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ38**	15/Jun/2005	7:33	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
RPD																			
Concentration in ppb (µg/L)	**NSJ04**	29/Jun/2005	12:50	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ04**	29/Jun/2005	12:53	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
RPD																			
Concentration in ppb (µg/L)	**SSJ03**	07/Jul/2005	11:40	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ03**	07/Jul/2005	11:43	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
RPD																			
Concentration in ppb (µg/L)	**FT19**	19/Jul/2005	9:10	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT19**	19/Jul/2005	9:13	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
RPD																			
Concentration in ppb (µg/L)	**SS05**	26/Jul/2005	9:00	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SS05**	26/Jul/2005	9:03	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
RPD																			
Concentration in ppb (µg/L)	**NSJ36**	28/Jul/2005	10:10	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ36**	28/Jul/2005	10:13	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
RPD																			
Field Blanks																			
Concentration in ppb (µg/L)	**SS05**	14/Jun/2005	13:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT24**	21/Jun/2005	9:21	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS11**	27/Jun/2005	13:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT31**	18/Jul/2005	11:51	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS12**	25/Jul/2005	10:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ10**	03/Aug/2005	11:11	ND	ND	ND	ND	ND	ND	ND	ND	ND	*ND*	ND	ND	ND	ND	ND	ND

**** Pesticides analyzed at screening level only by DFG-WPCL**

Table 27. Summary of Pesticide Field QA / QC data for the Irrigation Season 2005 (in µg/L).
Organochlorine Pesticides

	Site ID	Collection Date	Collection Time	DDD(o,p')	DDD(p,p')	DDE(o,p')	DDE(p,p')	DDT(o,p')	DDT(p,p')	Dicofol	Dieldrin	Endrin	Methoxychlor
Field Duplicates													
Concentration in ppb (µg/L)	**SS09**	14/Jun/2005	14:40	**0.005**	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SS09**	14/Jun/2005	14:43	**0.006**	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD				9									
Concentration in ppb (µg/L)	**CS15**	28/Jun/2005	8:00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS15**	28/Jun/2005	8:03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD													
Concentration in ppb (µg/L)	**SSJ10**	07/Jul/2005	13:10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ10**	07/Jul/2005	13:13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD													
Concentration in ppb (µg/L)	**FT23**	18/Jul/2005	14:50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT23**	18/Jul/2005	14:53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD													
Concentration in ppb (µg/L)	**FT05**	01/Aug/2005	14:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT05**	01/Aug/2005	14:33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD													
Concentration in ppb (µg/L)	**SSJ03**	03/Aug/2005	12:50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**SSJ03**	03/Aug/2005	12:53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RPD													
Field Blanks													
Concentration in ppb (µg/L)	**CS12**	13/Jun/2005	10:11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT19**	20/Jun/2005	14:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ34**	29/Jun/2005	9:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**FT18**	19/Jul/2005	10:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**CS24**	25/Jul/2005	9:11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Concentration in ppb (µg/L)	**NSJ32**	27/Jul/2005	9:01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 28. Summary of Pesticide Field QA / QC data for the Irrigation Season (in µg/L).
Fungicide Pesticides

	Site ID	Collection Date	Collection Time	Captan
Field Duplicates				
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:30	ND
Concentration in ppb (µg/L)	**NSJ04**	15/Jun/2005	9:33	ND
RPD				
Concentration in ppb (µg/L)	**FT05**	20/Jun/2005	15:10	ND
Concentration in ppb (µg/L)	**FT05**	20/Jun/2005	15:13	ND
RPD				
Concentration in ppb (µg/L)	**CS06**	27/Jun/2005	10:40	ND
Concentration in ppb (µg/L)	**CS06**	27/Jun/2005	10:43	ND
RPD				
Concentration in ppb (µg/L)	**CS06**	11/Jul/2005	11:00	ND
Concentration in ppb (µg/L)	**CS06**	11/Jul/2005	11:03	ND
RPD				
Concentration in ppb (µg/L)	**CS24**	25/Jul/2005	9:10	ND
Concentration in ppb (µg/L)	**CS24**	25/Jul/2005	9:13	ND
RPD				
Concentration in ppb (µg/L)	**FT31**	01/Aug/2005	13:00	ND
Concentration in ppb (µg/L)	**FT31**	01/Aug/2005	13:03	ND
RPD				
Field Blanks				
Concentration in ppb (µg/L)	**CS15**	13/Jun/2005	13:31	ND
Concentration in ppb (µg/L)	**SSJ04**	22/Jun/2005	9:51	ND
Concentration in ppb (µg/L)	**CS01**	27/Jun/2005	9:21	ND
Concentration in ppb (µg/L)	**FT05**	18/Jul/2005	13:11	ND
Concentration in ppb (µg/L)	**SS09**	26/Jul/2005	9:41	ND
Concentration in ppb (µg/L)	**SJC517**	28/Jul/2005	8:31	ND

Table 29. Summary of Nutrients, Physical Parameter and Hardness Field QA / QC data for the Irrigation Season 2005

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
DUPLICATES										
SS05	14/Jun/2005	13:20								53.5
SS05	14/Jun/2005	13:23								53.0
RPD										1
NSJ04	15/Jun/2005	9:30					16	103	1.4	
NSJ04	15/Jun/2005	9:33					18	107	1.5	
RPD							12	4	7	
FT24	21/Jun/2005	9:20	0.119	0.147	0.0117	0.0515				
FT24	21/Jun/2005	9:23	0.116	0.148	0.0117	0.0512				
RPD			3	1	0	1				
SSJ07	22/Jun/2005	8:40								237
SSJ07	22/Jun/2005	8:43								237
RPD										0
CS12	27/Jun/2005	7:50					16	125	34	
CS12	27/Jun/2005	7:53					18	112	35	
RPD							12	11	3	
NSJ04	29/Jun/2005	12:50	ND	0.0239	ND	0.0088 DNQ				
NSJ04	29/Jun/2005	12:53	ND	0.0229	ND	0.0089 DNQ				
RPD			NC	4	NC	NC				
FT18	05/Jul/2005	10:20					12	23	1.4	
FT18	05/Jul/2005	10:23					11	22	1.4	
RPD							9	4	0	
FT05	05/Jul/2005	12:40								15.0
FT05	05/Jul/2005	12:43								15.0
RPD										0
SSJ03	07/Jul/2005	11:40	ND	0.0069 DNQ	ND	0.0108				
SSJ03	07/Jul/2005	11:43	ND	ND	ND	0.0110				
RPD			NC	NC	NC	2				
SS05	12/Jul/2005	10:40	ND	0.0690	ND	0.0386				
SS05	12/Jul/2005	10:43	ND	0.0699	ND	0.0386				
RPD			NC	1	NC	0				
CS23	12/Jul/2005	8:30					6 DNQ	143	70	
CS23	12/Jul/2005	8:33					6 DNQ	132	70	
RPD							NC	8	0	
NSJ32	13/Jul/2005	9:20								142
NSJ32	13/Jul/2005	9:23								142
RPD										0
FT05	01/Aug/2005	14:30	ND	0.0570	ND	0.0095 DNQ				
FT05	01/Aug/2005	14:33	0.043 DNQ	0.0574	ND	0.0095 DNQ				
RPD			NC	1	NC	NC				
SJC516	28/Jul/2005	7:40					18	288	25	
SJC516	28/Jul/2005	7:43					13	299	22	
RPD							*32***	4	13	
CS12	25/Jul/2005	10:00								97.5
CS12	25/Jul/2005	10:03								92.4
RPD										13

Site ID	Date	Sample time	Ammonia as N (mg/L)	Nitrate + Nitrite as N (mg/L)	Nitrite as N (mg/L)	OrthoPhosphate as P (mg/L)	Color (color units)	Total Dissolved Solids (mg/L)	Turbidity NTU	Hardness as CaCO3 (mg/L)
BLANKS										
CS01	13/Jun/2005	8:31	ND	ND	ND	ND				
CS06	14/Jun/2005	8:51	ND	ND	ND	ND				
CS11	14/Jun/2005	11:31					ND	ND	ND	
NSJ28	16/Jun/2005	9:11	ND	ND	ND	ND				
FT31	20/Jun/2005	8:51					ND	ND	ND	
FT24	21/Jun/2005	9:21								ND
CS11	27/Jun/2005	13:01								ND
NSJ34	29/Jun/2005	9:01					ND	ND	*ND**	
SSJ07	07/Jul/2005	9:11								ND
SSJ07	20/Jul/2005	8:21					ND	ND	ND	
CS24	25/Jul/2005	9:11	0.055 DNQ	ND	ND	ND				
FT23	18/Jul/2005	14:51	ND	ND	ND	ND				
NSJ36	14/Jul/2005	10:21								ND
NSJ31	27/Jul/2005	9:31					ND	ND	ND	
FT31	01/Aug/2005	13:01								ND

NC=RPD not calculable

* = sample analyzed past holding time due to analyst error

** = Field duplicate RPD above QC limit

Table 30. Summary of Phosphorus Field QA / QC data for the Irrigation Season 2005 (in µg/L)

	Site ID	Collection Date	Collection Time	Phosphorus
Field Duplicates				
Concentration in ppb (µg/L)	SSJ04	22/Jun/2005	09:50	388
Concentration in ppb (µg/L)	SSJ04	22/Jun/2005	09:53	381
RPD				1.8
Concentration in ppb (µg/L)	NSJ31	15/Jun/2005	10:40	11.5
Concentration in ppb (µg/L)	NSJ31	15/Jun/2005	10:43	12.9
RPD				11.5
Concentration in ppb (µg/L)	CS23	28/Jun/2005	07:20	322
Concentration in ppb (µg/L)	CS23	28/Jun/2005	07:23	257
RPD				22.5
Concentration in ppb (µg/L)	NSJ36	14/Jul/2005	10:20	24.7
Concentration in ppb (µg/L)	NSJ36	14/Jul/2005	10:23	22.0
RPD				11.6
Concentration in ppb (µg/L)	FT05	01/Aug/2005	14:30	9.37
Concentration in ppb (µg/L)	FT05	01/Aug/2005	14:33	9.60
RPD				2.4
Field Blanks				
Concentration in ppb (µg/L)	FT23	21/Jun/2005	07:31	3.74
Concentration in ppb (µg/L)	NSJ32	29/Jun/2005	10:11	*6.19***
Concentration in ppb (µg/L)	SSJ10	20/Jul/2005	12:21	-2.00
Concentration in ppb (µg/L)	NSJ04	27/Jul/2005	10:41	-2.00
Lab Blanks by UCD				
Concentration in ppb (µg/L)	LBA	16/Jun/2005	00:00	-2.00
Concentration in ppb (µg/L)	LBNA	16/Jun/2005	00:00	3.63
			MDL	*2.00*
			RL	*6.00*

Values below the MDL are reported as negative the MDL

**IP - analyte detected in method, trip or equipment blank

LBA = Lab Blank by UCD acidified, LBNA = Lab Blank by UCD not acidified

Table 31. Summary of TOC Field QA / QC data for the Irrigation Season 2005

	Site ID	Collection Date	Collection Time	TOC in mg/L
Field Duplicates				
Concentration in (mg/L)	SS05	14/Jun/2005	13:20	3.980
Concentration in (mg/L)	SS05	14/Jun/2005	13:23	3.850
RPD				3.2
Concentration in (mg/L)	NSJ28	16/Jun/2005	9:10	1.970
Concentration in (mg/L)	NSJ28	16/Jun/2005	9:13	2.090
RPD				6.2
Concentration in (mg/L)	NSJ32	29/Jun/2005	10:10	5.810
Concentration in (mg/L)	NSJ32	29/Jun/2005	10:13	11.270
RPD				63.9*
Concentration in (mg/L)	*SSJ03*	*20/Jul/2005*	*10:40*	*3.02*
Concentration in (mg/L)	*SSJ03*	*20/Jul/2005*	*10:43*	*3.03*
RPD				*0.3*
Concentration in (mg/L)	*CS01*	*25/Jul/2005*	*8:00*	*2.46*
Concentration in (mg/L)	*CS01*	*25/Jul/2005*	*8:03*	*2.48*
RPD				0.8
Field Blanks				
Concentration in (mg/L)	NSJ36	16/Jun/2005	10:21	0.61
Concentration in (mg/L)	CS15	28/Jun/2005	8:01	0.350
Concentration in (mg/L)	FT05	05/Jul/2005	12:41	0.440
Concentration in (mg/L)	CS12	11/Jul/2005	7:51	0.480
Concentration in (mg/L)	*NSJ38*	*27/Jul/2005*	*7:41*	*0.385*

Italicized data (SSJ03, CS01, NSJ38) is analyzed by DFG-WPCL (MDL = 0.200, RL = 1.00)
Otherwise, MDL = 0.5mg/L / RL = 1mg/L
*FDP - Field duplicate RPD is above QC limit

Table 32. Summary of Metal Field QA / QC data for the Irrigation Season 2005 (in µg/L)

	Site ID	Collection Date	Collection Time	Boron	Arsenic	Cadmium	Copper	Nickel	Phosphorus	Lead	Selenium	Zinc
Field Duplicates												
Concentration in ppb (µg/L)	SSJ04	22/Jun/2005	09:50	0.0333	6.78	0.08	6.57	5.57	388	1.82	1.91	13.8
Concentration in ppb (µg/L)	SSJ04	22/Jun/2005	09:53	0.115	7.03	0.08	6.33	5.19	381	1.72	1.90	13.2
RPD				*110**	3.6	0.0	3.7	7.1	1.8	5.6	0.5	4.4
Concentration in ppb (µg/L)	NSJ31	15/Jun/2005	10:40	0.0225	0.48	-0.01	1.86	0.82	11.5	0.10	0.63	0.59
Concentration in ppb (µg/L)	NSJ31	15/Jun/2005	10:43	0.0225	0.51	-0.01	1.91	0.90	12.9	0.13	0.97	0.69
RPD				0	6.1	NC	2.7	9.3	11.5	26.1	*43**	15.6
Concentration in ppb (µg/L)	CS23	28/Jun/2005	07:20	0.0573	1.47	0.09	34.2	43.3	322	5.96	-0.10	54.4
Concentration in ppb (µg/L)	CS23	28/Jun/2005	07:23	0.0624	1.05	0.08	26.5	32.0	257	4.73	-0.10	44.4
RPD				8.5	*33**	11.8	25.4	*30**	22.5	23.0	NC	20.2
Concentration in ppb (µg/L)	NSJ36	14/Jul/2005	10:20	0.0092	0.39	0.02	1.42	0.26	24.7	0.66	0.40	4.45
Concentration in ppb (µg/L)	NSJ36	14/Jul/2005	10:23	0.0091	0.34	-0.01	1.39	0.27	22.0	0.66	0.18	4.29
RPD				1.1	13.7	NC	2.1	3.8	11.6	0.0	*76**	3.7
Concentration in ppb (µg/L)	FT05	01/Aug/2005	14:30	0.0032	0.53	0.02	6.04	0.50	9.37	0.37	0.18	2.83
Concentration in ppb (µg/L)	FT05	01/Aug/2005	14:33	0.0032	0.43	0.01	5.61	0.48	9.60	0.34	0.34	2.47
RPD				0.0	20.8	*67**	7.4	4.1	2.4	8.5	*62**	13.6
Field Blanks												
Concentration in ppb (µg/L)	FT23	21/Jun/2005	07:31	*0.0311***	-0.10	-0.01	*0.05***	*0.06***	3.74	0.02	0.48	*48.3***
Concentration in ppb (µg/L)	NSJ32	29/Jun/2005	10:11	*0.0327***	-0.10	-0.01	*0.05***	0.03	*6.19***	*0.03***	-0.10	*16***
Concentration in ppb (µg/L)	SSJ10	20/Jul/2005	12:21	*0.0043***	-0.10	-0.01	0.01	-0.01	-2.00	-0.01	0.33	-0.10
Concentration in ppb (µg/L)	NSJ04	27/Jul/2005	10:41	*0.0221***	-0.10	-0.01	*0.04***	0.03	-2.00	-0.01	*0.51***	*7.53***
Lab Blanks by UCD												
Concentration in ppb (µg/L)	LBA	16/Jun/2005	00:00	*0.0217***	-0.10	-0.01	*0.1***	*0.05***	-2.00	0.01	0.38	*2.58***
Concentration in ppb (µg/L)	LBNA	16/Jun/2005	00:00	*0.0292***	-0.10	0.01	*0.35***	0.04	3.63	*0.05***	*0.87***	*37.2***
			MDL	*0.0002*	*0.10*	*0.01*	*0.01*	*0.01*	*2.00*	*0.01*	*0.10*	*0.10*
			RL	*0.0006*	*0.30*	*0.03*	*0.03*	*0.05*	*6.00*	*0.03*	*0.50*	*0.30*

Values below the MDL are reported as negative the MDL (ie -0.01 for Cd)

*FDP - field duplicate RPD above QC limit

**IP - analyte detected in method, trip or equipment blank

NC = not calculable

LBA = Lab Blank by UCD acidified, LBNA = Lab Blank by UCD not acidified

Table. 33 Summary of Water Column Toxicity QA/QC data for the Irrigation Season 2005

Site ID	Date	Time	*Ceriodaphnia dubia 96-hour survival (in %), (*indicates significant different to control group)*	*Pimephales promelas 96-hour survival (in %), (*indicates significant different to control group)*	*Selenastrum capricornutum (Y indicates significant different growth to control group)*
Field Duplicates					
SS05	06/14/05	13:20	**0*,a,b**	92.5	N
SS05	06/14/05	13:23	**0*,a**	87.5*	N
NSJ28	06/30/05	7:50	100	90.2	N
NSJ28	06/30/05	7:53	100	87.5	N
FT23	07/06/05	8:30	100	100	N
FT23	07/06/05	8:33	100	100	N
SJC516	07/14/05	7:30	100	100	N
SJC516	07/14/05	7:33	100	100	N
SS05	07/26/05	9:00	100	95.5	N
SS05	07/26/05	9:03	100	97.5	N
Field Blanks					
NSJ28	06/16/05	9:11	100	90	N
CS15	06/28/05	8:01	100	97.5	N
SSJ07	07/07/05	9:11	100	97.5	N
SS09	07/12/05	11:31	100	100	N
FT18	08/02/05	8:41	100	100	N

a = All dead in 48 hours

b = Acute *Ceriodaphnia* TIE

TABLE 34. Summary of Ag Waiver Phase I TIEs

Sample (Date) TIE#	*Test Species*	*Baseline TUa*	*SPE Removed All Toxicity*	*Toxicity Recovered from SPE*	*PBO Prevented All Toxicity*	*Comment*
CS15 (2/16/05) 1	Algae	3.8	Yes	Yes	n/a	Non-polar organics suspected (herbicides?)
SS06 (2/16/05) 2	Algae	5.4	Yes	Partial	n/a	Non-polar organics suspected (herbicides?)
CS01 (7/11/05) 3	Algae	10.8	Yes	Yes	n/a	Non-polar organics suspected (herbicides?)
CS15 (1/26/05) 4	*Ceriodaphnia*	1.3	Yes	No	Yes	OPs suspected
SSJ03 (1/27/05) 5	*Ceriodaphnia*	2.7	Yes	Yes	Yes	OPs suspected
CS15 (2/16/05) 6	*Ceriodaphnia*	10.7	Yes	Yes	Prevented most but not all toxicity	Too much toxicity for PBO to completely prevent. High concentrations of OPs suspected
CS12 (6/13/05) 7	*Ceriodaphnia*	1.3	Yes	Partial	Yes	OPs suspected
CS23 (6/13/05) 8	*Ceriodaphnia*	5.3	Yes	Yes	Yes	OPs suspected
SS05A (6/14/05) 9	*Ceriodaphnia*	21.3	Yes	Yes	Prevented all but 1.2 TUa	Too much toxicity for PBO to completely prevent. High concentrations of OPs suspected
SSJ03 (7/7/05) 10	*Ceriodaphnia*	2.7	Yes	Yes	Prevented 1.3 TUa	OPs + other non-polar organics suspected
SSJ04 (7/7/05) 11	*Ceriodaphnia*	22.7	Yes	Yes	Prevented all but 2.8 TUa	Too much toxicity for PBO to completely prevent. High concentrations of OPs suspected
SSJ07A (7/7/05) 12	*Ceriodaphnia*	1.3	Yes	Yes	Yes	OPs suspected
NSJ31 (7/13/05) 13	*Ceriodaphnia*	1.3	Yes	Mostly	Most but not all toxicity	OPs + other non-polar organics suspected
SSJ04 (7/20/05) 14	*Ceriodaphnia*	~ 1 (50% mort. at 100%)	Yes	No	Prevented most but not all toxicity	Sample lost toxicity. OPs + other non-polar organics suspected
CS12 (7/25/05) 15	*Ceriodaphnia*	1.3	Yes	No	See comment	PBO strongly synergized toxicity; pyrethroid enzyme prevented synergism. Pyrethroids suspected.

TABLE 34. (Con'td) Summary of Ag Waiver Phase I TIEs

Sample (Date)	*Test Species*	*Baseline TUa*	*SPE Removed*	*Toxicity Recovered*	*PBO Prevented*	*Comment*
CS24 (7/25/05) 16	*Ceriodaphnia*	2.7	Yes	Yes	Delayed but did not prevent	OPs + other non-polar organics suspected
NSJ32 (7/27/05) 17	*Ceriodaphnia*	4.7	Yes	Yes	Mostly	OPs + other non-polar organics suspected
FT24 (8/1/05) 18	*Ceriodaphnia*	5.3	Yes	Yes	Yes	OPs suspected
SSJ04 (8/3/05) 19	*Ceriodaphnia*	1.3	Yes	Partial	Yes	OPs suspected

TABLE 34a. Summary of Ag Waiver II 3-species Toxicity Results

Species	*Number Of Samples Tested*[a]	*Toxic Samples*	*% Toxic Samples*	*Number Of TIEs*
Algae	150	11	7	3
Ceriodaphnia	151	20	13	16
Fathead Minnow	150	3	2	0
TOTAL	151	34	-	19

a - Excludes QA samples (total of 10)

APPENIDIX II: SEDIMENT SAMPLING REPORT

This report includes a summary of findings from both the wet season samples (March/April) and irrigation season samples (August) of 2005 as both these data sets had not been included in previous quarterly updates. At both these times the data include two largely discrete sample efforts. First, the regular Irrigated Lands Program samples were collected throughout the Central Valley and in most cases both water and sediment data are available for these sites, though only sediment data are presented herein. Secondly, special sediment-only sampling efforts were made in Fresno and Tulare Counties, and to a lesser extent Kings County, in both the wet and irrigation seasons. These efforts were made since sediments of this area had been historically under-sampled relative to many other portions of the Central Valley regions, and there was very little data on sediment quality in these regions. Data from these two sampling efforts are merged below, thus Fresno and Tulare county sites are disproportionately represented.

WET SEASON SAMPLING – MARCH AND APRIL, 2005

- All sediment samples were tested for toxicity to the amphipod, Hyalella azteca, using a 10-d exposure and mortality as the endpoint. Excluding samples collected under the special study in the southern Central Valley counties, there was no toxicity found in any of the wet season samples (Table 1).

- Of 14 samples collected in Fresno, Kings, and Tulare Counties, five of those samples (36%) showed toxicity to H. azteca (Table 2).

- Based on a comparison between actual pyrethroid concentrations in these five toxic samples, and the levels of pyrethroids reported in the literature to be toxic to H. azteca, pyrethroids could have been responsible for all or much of the toxicity. No one pyrethroid was consistently elevated, but cypermethrin, lambda-cyhalothrin, and esfenvalerate were present at acutely toxic levels in one or more samples.

- One sample from Tulare County (SED20) contained chlorpyrifos at several times the level toxic to Hyalella. This sample contained chlorpyrifos, esfenvalerate, and cypermethrin, any one of which would have been adequate to cause the observed near total mortality.

Table 1. Sediment samples collected during dormant season sampling 2005, showing no increase in H. azteca mortality relative to controls.

Station #	County	Site location
CS07	Butte	Butte Creek @ Durham Dayton Highway
SED29	Butte	Big Chico Creek @ Grape
SED30	Butte	Mud Creek @ Meridian
CS15	Colusa	Spring Creek @ Walnut Drive
SED21	Fresno	Kings River @ Olson Rd.
SED22	Fresno	Murphy Slough @ Elm
SED24	Fresno	Stinson Canal @ Kamm
SED26	Fresno	Holland Drain @ Hudson
SED27	Glenn	Stony Creek @ Hwy 32
SED28	Glenn	Colusa Drain @ Hwy162
SSJ03	Madera	Berenda Creek @ Ave 17.5
SSJ12	Merced	Duck Slough @ Arboleda Dr.
SED11	San Joaquin	Drain on Sarale Farms along Bonetti Dr.
NSJ28	San Joaquin	Pixley Slough @ Eightmile Red
NSJ32	San Joaquin	Bear Creek @ Alpine Rd.
NSJ18	Stanislaus	Orestimba Creek @ Kilburn Rd
SED16	Tulare	Deer Creek @ Alila Ave.
SED17	Tulare	Farmers Ditch @ Rt. 137
SED19	Tulare	King Ditch @ Ave 368 and Road 60
FT03	Tulare	Elbow Creek @ Rd. 112N
FT05	Tulare	Button Ditch on Ave. 368 west of Alta Ave.
SS06	Yolo	Winters Canal @ Rd. 86A

Table 2. Sediment samples collected during dormant season sampling 2005, showing increased H. azteca mortality relative to controls. Identification of likely toxicant based on comparison of chemical concentrations in the sample relative to those levels known to be acutely toxic.

Station #	County	Site location	Survival H. azteca (%)	Comments
SED23	Fresno	Turner Ditch @ Marks	42	Toxicity possibly due to cypermethrin, though awaiting final organic carbon results for confirmation.
SED25	Fresno	Poso Slough @ Hudson	26	Toxicity likely due to lambda-cyhalothrin
SED15	Kings	Ditch on S. side of Utica Ave.	9	Toxicity likely due to lambda-cyhalothrin
SED18	Tulare	Mill Creek @ Rd. 168	42	Toxicity likely due to bifenthrin
SED20	Tulare	Knestric Ditch @ Rt 201	9	Esfenvalerate, cypermethrin and chlorpyrifos all well above acutely toxic levels

IRRIGATION SEASON – AUGUST 2005

- Of 34 sites sampled in the 2005 irrigation season, 12 (35%) showed toxicity to H. azteca (Tables 3 and 4).

- Within the southern counties (Fresno, Kings, Tulare), 6 of 17 sites showed toxicity (35%). This is comparable to the percentage of southern county sites that had been toxic during wet season sampling (36%).

- Several sites showed extreme toxicity with all or very nearly all of the H. azteca failing to survive the 10-d exposure. These sites include those in Colusa (CS15), Glenn (CS12), Kings (SED15), and Fresno (FT19, SED25) Counties.

- Station SED20 that had had only 9% survival and acutely toxic concentrations of cypermethrin, esfenvalerate, and chlorpyrifos in the sediment when sampled in March 2005, showed no toxicity five months later in August 2005. This observation suggests relatively short persistence of these compounds, though for the most part data are lacking in the literature to confirm this possibility. Sediment transport and spatial heterogeneity are also possible explanations, though the later is not considered likely as the two samples were collected within a few feet of one another.

- Sediment chemistry results from this round of sampling were atypical compared to previous sampling events in that chlorpyrifos was found in far more samples and at higher concentrations than seen before. There were three samples in which it was well above the acutely toxic concentration to H. azteca, and borderline in a few others.

- Among the pyrethroids, bifenthrin was found most commonly, and was at toxic levels in four samples. Pyrethroids in general tended to be found less frequently in the summer 2005 samples than in previous sampling events.

- Dilution series have been done with several of the more toxic samples, and analyses of those data are in progress.

- Sediment TIE development efforts are on-going, and procedures are being tested on some of the more toxic samples.

Table 3. Sediment samples collected during irrigation season sampling 2005, showing no increase in H. azteca mortality relative to controls.

Station #	County	Site location
FT18	Fresno	Drain to Fink Ditch, north side Central Ave.
SED22	Fresno	Murphy Slough @ Elm
SED23	Fresno	Turner Ditch @ Marks
FT31	Kings	People's Ditch west of 10th and Elder Ave.
FT25	Kings	Melga Canal near Tulare Lake bottom
SSJ03	Madera	Berenda Creek @ Ave. 17.5
SSJ10	Merced	Owens Creek @ Gurr Rd.
S-SI	Sacramento	Unnamed drain along Sutter Island X Rd
S-LO	Sutter	Live Oak Slough @ Eager Rd
CS11	Sutter	Bear River @ Pleasant Grove Rd.
SS05	Sutter	North Main Canal @ Sankey Rd.
SS09	Sutter	N-S Ditch along Natomas Rd.
NSJ28	San Joaquin	Pixley Slough @ Eightmile Rd
NSJ32	San Joaquin	Bear Creek @ Alpine Rd
SJC517	San Joaquin	Mid Roberts Island Drain @ Woodsbro Rd.
SJC516	San Joaquin	Unnamed Drain @ Howard Rd.
FT24	Tulare	Elk Bayou above Tule River channel @ Rd 96
SED17	Tulare	Farmers Ditch @ Rt. 137
SED18	Tulare	Mill Creek @ Rd. 168
SED19	Tulare	King Ditch @ Ave 368 and Rd. 60
FT05	Tulare	Button Ditch @ Ave 368 west of Alta Ave
SED20	Tulare	Knestric Ditch @ Rt. 201

Table 4. Sediment samples collected during irrigation season sampling 2005, showing increased H. azteca mortality relative to controls. Identification of likely toxicant based on comparison of chemical concentrations in the sample relative to those levels known to be acutely toxic, however all suspected causes are provisional pending completion of on-going TIE work.

Station #	County	Site location	Survival H. azteca (%)	Comments
CS06	Butte	Comanche Creek @ Dayton Rd	79	Unknown cause
CS15	Colusa	Spring Creek @ Walnut Drive	4	Toxicity possibly due to bifenthrin and/or chlorpyrifos
CS12	Glenn	Unnamed drain to Walker Creek @ Rd. 28	1	Unknown cause
FT19	Fresno	Drain to Wooten Creek, east of Hill Rd.	0	Toxicity likely due to chlorpyrifos
SED15	Kings	Ditch on South side of Utica Ave.	0	Chlorpyrifos, bifenthrin and lambda-cyhalothrin all at acutely toxic levels
SED24	Fresno	Stinson Ditch @ Kamm	13	Toxicity possibly due to bifenthrin
SED25	Fresno	Poso Slough @ Hudson	0	Awaiting data
SED26	Fresno	Holland Drain @ Hudson	13	Awaiting data
SSJ04	Merced	Island Field Drain @ Catrina Rd.	18	Unknown cause
SSJ07	Merced	Boundary Drain @ Henry Miller Ave.	28	Toxicity likely due to bifenthrin
NSJ31	San Joaquin	Calaveras River @ Pezzi Rd	81	Awaiting data
FT03	Tulare	Elbow Creek @ Rd. 112	69	Unknown cause